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CLINICAL SURGERY.

THE

INJURIES AND DISEASES

OF THE

NERVOUS SYSTEM.

BY

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PART I.

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INTRODUCTION.

THE illustration of disease and of the results of injuries by the quotation of cases has always been a favorite method of imparting knowledge, and the careful study of these examples is a method equally valuable as a means of acquiring it; for by giving the material from which facts and principles are deduced, the author and his readers are placed upon a par, and the latter are enabled to verify the truth of the former's opinions.

With that view, it is my intention, in a series of papers, to illustrate the surgery of the different regions of the body, to give cases and facts deduced from them to support any opinion I may express, and thus to make my readers thoroughly able to understand the principles which have guided the surgeons of a large metropolitan hospital in their practice, and to show that this practice is based upon scientific and pathological inquiries.

These papers will be published in different parts, and the present (Part I) will include the injuries to the skull and spine, with their contents, briefly noticing also some of the diseases. The cases quoted have all been under personal observation, and have taken place within the last five years, in my own practice and that of my colleagues. They are taken

from my own notes, although to my colleague, Dr. Wilks, I have been indebted for many of the particulars of the post-mortem appearances.

It will be quite impossible to illustrate every point which the surgery of the different regions may present; but I trust that nothing which is practical will be omitted, and that the pathology of the diseases and injuries will be so represented as to indicate the basis of a scientific practice.

It will be my aim to illustrate the principal injuries which may take place, to give examples of each form, and to point out the symptoms by which each may be distinguished; to indicate by cases the complications which are generally found, and the pathological conditions and symptoms with which these complications are connected; and, lastly, the principles of treatment will receive attention, and the practice which should be employed in the various conditions illustrated by the quotation of examples.

Where numbers are of value in the support of any line of practice or any pathological fact, they will be given, and the whole source from which this material is drawn will be found tabulated in an ensuing page.

The brief consideration of scalp wounds will first claim our attention, and then we shall proceed to the more serious subject of concussion of the brain, fracture of the skull, and encephalic injuries.

How far I have succeeded it must be for my readers to determine, but I believe that few material points have been left unnoticed, and that this part embraces the whole clinical surgery of the region to which it is confined.

Upon future occasions the surgery of other regions of the human frame will be illustrated in a like manner, and it is hoped that, when completed, the whole will form a Clinical Surgery which will be found not only useful as a guide to the student, but also as a book of reference to the practitioner.

WELLINGTON STREET, LONDON BRIDGE ;
January, 1860.

Table of the Injuries and Diseases of the Nervous System admitted into Guy's Hospital from October 1st, 1853, to January 1st, 1859.

	Cured.	Relieved.	Died.	Total.
Scalp-wounds	116	—	—	116
Concussion of the brain—simple	56	—	—	56
" " complicated	24	—	2	26
Fracture of the vault of skull	12	—	31	43
" " base	12	—	18	30
Apoplexy with injury	—	—	4	4
Concussion of the spine	22	—	—	22
Dislocation of the spine	—	—	6	6
Fracture and dislocation	—	3	15	18
Lateral curvature of spine	—	5	—	5
Diseased spine—cervical	—	15	—	15
" " dorsal and lumbar	—	19	—	19
Spinal abscess—cervical	—	1	—	1
" " psoas	—	22	3	25
" " lumbar	—	18	2	20
" " gluteal	—	1	1	2
Spinal paralysis	—	11	6	17
Total	242	95	88	425

SCALP-WOUNDS.

Amongst the 120 examples admitted into the hospital were 116 cases of a simple character and uncomplicated, although tolerably extensive. They were all treated by sutures, strapping, pads of lint, or warm-water dressing; in no one instance did a bad symptom follow, and in all a good recovery took place. In some instances hæmorrhage was present, checked by the application of a ligature to the bleeding vessel, cold water, and pressure.

Two cases only were followed by erysipelas, successfully treated with iron and stimulants, the application of flour to the head being the only local remedy.

One was followed by suppuration beneath the scalp, and the subsequent exfoliation of a small piece of bone upon the fiftieth day, and a speedy cure.

In one instance, of a boy, æt. 10, of a pale cachectic aspect,

the hæmorrhagic tendency was associated with the injury. After a small scalp-wound, received four days before his admission, constant bleeding had taken place. All pressure by pads, &c., had failed, and the only successful remedy was the application of a styptic in the form of the perchloride of iron; iron was also given internally, and a good recovery ensued.

This patient had always experienced the same hæmorrhagic tendency after the receipt of any wound, and he had also a sister with the same disposition.

From the preceding analysis it would appear that scalp-wounds, as a rule, have a tendency to do well; that the complication of erysipelas, which has been regarded as a frequent one, is by no means so; and that when it takes place it has not a very injurious tendency.

That exfoliation of bone may occasionally follow an injury to the scalp; and that the *treatment* of scalp-wounds should be as simple as possible.

When the wound is a small one, and the edges gape to any extent, the application of a small strip of adhesive plaster, just sufficient to bring the edges of the wound together, is the best treatment, and a soft pad of lint subsequently applied, so as to afford gentle pressure.

When the edges are fairly in apposition, a simple pad is all that is necessary, or perhaps only a piece of wet lint.

But when the wound is an extensive one, and the scalp is separated from the bones beneath, sutures must be applied, the wound having been previously thoroughly cleansed from all foreign bodies, and the edges well adapted.

Strapping between the sutures may be required to maintain the edges together, but the wound should not be covered in by any plaster; a pad of lint may then be adjusted, but if the soft parts are much injured, a simple layer of lint or linen kept moist is to be preferred.

Under this treatment the wounds generally do well. The patient should be kept at rest as much as possible, especially if the wound be very extensive; an occasional purgative may be required, and moderate diet allowed.

CHAPTER I.

CONCUSSION OF THE BRAIN.

Any uneducated person, upon handling a skull and examining closely its interior, would be struck with the strange irregularity of its base, and with its numerous prominent and projecting processes. If he were then to examine and handle the brain itself, and to see of what soft and easily lacerable material this important organ was composed, he would not be surprised that any sudden shake or jar, any blow or injury, however slight, would, as a necessary consequence, be followed by some interference with the delicate functions of this most delicate of structures, if it did not produce some mechanical injury to the brain itself.

Anatomists and surgeons are well aware with what care nature has protected the nervous ganglia, how carefully the brain is guarded from external injury, and how beautifully it is suspended, or rather floated, upon its "water-bed." Numerous indeed are the other points which might be indicated, denoting the same forethought, and all directed to the same end; and although this end is generally attained, and the brain is, as a rule, so well guarded that it requires some considerable force to injure it from without, and an equivalent to produce an injury from within, still the practical surgeon is too frequently called upon to witness cases where the functions of the brain are, for a time, considerably interfered with, if not arrested, and where, from mechanical force applied externally, the centres themselves are more or less injured.

The subject of concussion will first claim our attention, and will be discussed in the following chapter.

Concussion of the brain may be considered under different heads, a division of the subject being necessary, as the same injury may be followed by different results.

In some cases an interruption only to the functions of the brain may be produced, although this interruption may be for a short or long duration; in some instances the functions of the brain will be totally suspended, and this suspension will vary in different cases.

At times a fatal termination will take place, and some mechanical injury to the nervous centres themselves will then generally be found.

I propose, therefore, to consider the subject of concussion of the brain under two heads :

1st. *The simple form*, where an interruption only of the functions of the organ follows the injury.

2d. *The complicated form*, where the brain itself is injured, and associated with extravasation of blood, either upon or within its structure.

SECTION I.

Under the heading of "simple concussion" of the brain I include those cases only which are characterised by some temporary interruption or suspension of its functions, and which, by rest and the lapse of variable periods of time, are restored to their natural condition.

I have fifty-six examples of this description, in eight of which a scalp-wound existed ; in all, the functions of the brain were more or less suspended, as indicated by loss of consciousness and the power of motion ; by rest, the application of cold to the head, warmth to the feet, and, in some few instances, the administration of a mild purgative, perfect recovery ensued.

In many instances, however, the case is more complicated ; the accident is immediately followed by some complication, such as hæmorrhage from the nose or ears, or, more remotely, by signs of increased action or inflammation of the cerebral membranes ; and from my notes of twenty-six examples of this description I propose to extract such cases as will illustrate the subject, giving them as briefly as will be consistent with clearness, and as may be sufficient for the purpose intended.

In the simplest form of concussion of the brain a patient receives a blow or injury which produces some severe shaking of the cranial contents, and this shaking is followed by a loss of consciousness more or less perfect, and also a loss of all power of motion. If the patient is seen at this time, the skin will be cold, and the features more or less contracted, the pulse will be slow and intermittent, the pupils very variable,

in some cases dilated, in others contracted, and, in a third class, one will be dilated and the other contracted.

If the patient is watched, and the case is not one of great severity, after a variable period there will be signs of movement; he will perhaps move a limb, in an impatient and objectless manner; if he is spoken to with a loud voice, he will perhaps show some evident signs of returning consciousness, either by making some inarticulate noise, or by merely opening his eyes, and again returning to his stolid condition.

If the case is still carefully observed, the mode of respiration may become altered; from being slow and labouring, it will be irregular, and perhaps sighing.

After a time, other signs of what are termed reaction will make their appearance—the skin will become warmer and more natural, the shrunken and contracted features will return to their former condition, the pulse will be felt more regular and more rapid, and, what is very frequent, vomiting may appear. This symptom is one of value, it generally shows itself upon the first appearance of what is called reaction, and is apparently the first result of a more active circulation through the cerebral centres. If all goes on well, the patient rapidly recovers, and returns to his natural condition, feeling perhaps for a few days somewhat heavy and drowsy, and indisposed for any bodily and much less mental labour.

In this brief sketch of an ordinary and uncomplicated example of concussion of the brain the symptoms are very marked, and are not associated with any complications, either primarily or after the period of reaction has taken place. In the following examples, however, some such occurred, and I shall at present bring forward only specimens of the primary.

The first examples will be those where the accident was followed by hæmorrhage from the nose, ears, or into the eyelids.

CASE I.—EPISTAXIS AND HÆMORRHAGE INTO EYELIDS.

E. P—, a boy, æt. 13, fell off a ladder twenty-five feet, the fall rendering him perfectly unconscious and motionless. He was admitted shortly afterwards in this condition, with *ecchymosis into the lids of both eyes*, and also with *epistaxis* from the right nostril; in about eight hours reaction appeared,

with vomiting, consciousness then returned, and he rapidly convalesced.

CASE 11.—HÆMORRHAGE FROM THE EAR, AND EXCESS OF REACTION.

A man, æt. 38, having been thrown from his cart upon his head, was admitted in a partially unconscious and paralytic condition, with a cold skin and labouring pulse, and also with *profuse hæmorrhage* from the left ear. It commenced immediately after the injury, and continued for about three hours. Reaction rapidly appeared, and upon the fourth day the man complained of intense pain shooting through his head and general drowsiness; there were symptoms of feverish excitement and a very anxious expression. A blister was applied to the neck, and one grain of calomel given every four hours; upon the third day all pain had ceased, fever had subsided, and a natural expression had returned; and after two weeks he left well, with the hearing perfectly sound.

The two cases just quoted are not uncommon examples of concussion, as hæmorrhage from the nose and ears are frequent associates of such an injury; but in all such instances the hæmorrhage will be limited. When the nose is the outlet through which blood escapes, the bleeding, as a rule, appears directly after the receipt of the injury, and soon ceases; when the ear is the source of bleeding, it may continue for some few hours and then subside, but it is never followed by the clear serous discharge which is found in cases of fractured bone. It is true that some thin semipurulent discharge may follow upon a discharge of blood, but this probably takes place merely from the coagulation of some blood within the external auditory passage, and its subsequent softening down.

When hæmorrhage takes place into the eyelids, it may be the result of a direct blow, but it is frequently produced by the concussion; the blood, however, will be confined to the eyelids, and will not appear as a subconjunctival ecchymosis, as is seen in fracture of the base through the orbital plates.

We will now pass on, and quote some few cases illustrating the condition of cerebral disturbance which follows upon the accident. In the simplest examples, as previously stated, the

patient, after the receipt of the injury, becomes either totally or partially unconscious, and, after a variable period, gradually or rapidly regains his natural condition; but in the instances I am about to quote, after a partial return of consciousness, there was a relapse, and the patient returned to his insensible condition. This condition will be denominated a "relapsing unconsciousness," as adequately expressing the exact condition of affairs. It is not a dangerous condition, nor does it appear to indicate any definite complication, but it is a point worthy of observation, as it might lead the surgeon to believe in the existence of some more serious encephalic injury.

CASE III.—CONCUSSION OF THE BRAIN; RELAPSING UNCONSCIOUSNESS.

A boy, æt. 9, when sliding, fell upon his face and struck his forehead with some force; the accident was followed by complete insensibility and inability to move; he remained in this condition for about fifteen minutes, and when brought to the hospital was partially sensible, and could answer questions, complaining of pain over the injured front. He was put to bed, and *gradually became perfectly insensible*, and his extremities, when lifted, fell powerless; in this condition he remained for an hour, and then showed symptoms of returning consciousness; he vomited severely, bringing up some blood, which had evidently been swallowed; a mercurial purge was given, and cold applied to the head; he remained heavy and drowsy for two days, when roused immediately returning to his sleepy condition, but left the hospital in ten days, cured.

Cases like the preceding are not uncommon, although perhaps they are not so well marked; the relapsing unconsciousness would appear to be produced by the earliest effects of reaction, the vessels yielding too freely to the heart's action, and thus producing a plethora of the part, which induces a comatose or semi-comatose condition. The following case would tend to prove the correctness of this opinion.

CASE IV.—CONCUSSION ; RELAPSING UNCONSCIOUSNESS ;
EPISTAXIS.

A boy, æt. 11, having received a blow upon the head from a falling piece of timber, became perfectly unconscious and quiescent; he remained in this state for fifteen minutes, and recovering, he walked home some short distance. He soon began to feel sick, and vomited, this vomiting being attended with *epistaxis*. He was then brought to the hospital, *with a cold skin and labouring pulse; he was very slightly conscious, refusing to answer any questions, and his limbs remained in the position in which they were placed. The pupils were dilated, but active.* He was left in bed, with the head raised, and cold lotion applied to it, and warmth to the feet, and he gradually recovered, leaving the hospital well ten days after admission.

Having given the complications which are frequently seen in cases of concussion of a simple character—that is, where no lesion of the brain has taken place—I will now proceed to discuss the subject of reaction, and to consider the symptoms and complications which may be found in such a condition.

In the case last quoted it appears probable that a return to a semi-unconscious condition may be produced by a simple reaction, and that epistaxis may also be a symptom of the same process. Vomiting has also been mentioned as an early accompaniment of the restoration of the circulation through the brain, and many cases might be quoted to illustrate the connexion. The following, however, will suffice.

CASE V.—CONCUSSION OF BRAIN ; REACTION, WITH VOMITING.

A boy, æt. 16, fell off a railway tender upon his head; he was picked up perfectly insensible and paralysed, and brought to Guy's. When admitted he was quite unconscious, and unable to move his limbs; the skin was cold, pulse slow, respiration laboured, and pupils irregular but active; in about an hour reaction showed its earliest symptoms by some mobility and vomiting, the skin also becoming warmer; from this moment he rapidly recovered.

The next complication which may be found associated with and produced by the process of reaction, after simple and uncomplicated concussion, is *convulsions*, and is well illustrated in the following cases.

CASE VI.—CONCUSSION ; REACTION, WITH VOMITING AND CONVULSIONS.

A boy, æt. 15, having fallen from a height of fifteen feet backwards upon his head, was picked up perfectly insensible and paralysed; he was immediately brought to Guy's in this condition, and placed in bed. In about half an hour reaction appeared, accompanied with vomiting and convulsions, he then became partially sensible; for twenty-four hours afterwards he remained in a drowsy and confused condition, with dilated but active pupils, a quick pulse, and he vomited at intervals. A mercurial purge was given, and cold applications employed to the head, and a steady recovery ensued, without any bad symptom.

CASE VII.—CONCUSSION ; REACTION AND CONVULSIONS.

A boy, æt. 9, having fallen from the height of twelve feet upon his head, was rendered completely insensible. He was admitted in this condition three hours after the accident; in a few hours he became violently convulsed (as an epileptic), and remained so for one hour and a half. His breathing became stertorous, and he vomited; he then fell into a deep sleep, and awoke sensible; the head was shaved, and four grains of calomel administered. The following day he was drowsy, although sensible; the pupils were active but irregular; pulse hard, and 84. Two grains of gray powder and three of Dover's powder were given twice a day. Upon the next day, the third after the accident, he became perfectly natural; he was kept quiet, and the mercurial was continued with the best effects, the boy leaving the hospital cured fourteen days after his admission.

The two cases just given are sufficient to prove the connexion between reaction and convulsions; the latter could

hardly have been produced by any inflammatory or other cerebral injury, as other symptoms would have accompanied it, and the steady and rapid convalescence of both patients forbids the idea of any such complication.

I shall now pass on to consider other complications, and to illustrate them by an example of each kind. Some pain in the head after concussion is generally present, but in some instances it is of a very severe character.

CASE VIII. — RELAPSING UNCONSCIOUSNESS; REACTION,
ATTENDED WITH ACUTE PAIN IN THE HEAD.

A boy, æt. 15, fell off a scaffold upon his head, a distance of twelve feet; he was taken up quite unconscious, and unable to move, and admitted into Guy's in such a condition. After a few hours' rest in bed he began to show signs of animation, but speedily relapsed. In about twelve hours he became sensible, and complained of *most intense pain through his head*; this was shaved, and cold lotions applied, a purgative was also administered; in another twelve hours this pain had left him, and he rapidly convalesced.

The next complication is of simple delirium occurring when reaction was established, and then rapidly subsiding. It can be illustrated by the following case.

CASE IX.—CONCUSSION, REACTION, AND DELIRIUM.

A man, æt. 35, who received a blow upon the head, causing a scalp-wound and partial insensibility, was admitted into the hospital with cold skin, labouring pulse, and slow breathing; he soon, however, became perfectly conscious, but also *delirious*. His skin became hot and pulse quick. The gray powder and Dover's powder were given three times a day in three-grain doses, and after twenty-four hours all bad symptoms had disappeared; recovery was retarded by an attack of erysipelas, but he left the hospital cured in six weeks.

Having thus illustrated the subject of concussion by simple

cases, and others associated both during their primary stage and also during the stage of reaction with certain complications, we pass on to the consideration of others, in which the stage of reaction has been somewhat excessive, and has been accompanied by complications of a different character, being evidently produced by some inflammatory action.

In Case II, already quoted, reaction had been evidently in excess, producing symptoms of some slight inflammatory action; treatment, however, fortunately proved of value, and checked its course.

In the following example a slight concussion of the brain was followed by inflammatory symptoms, causing squinting, which, however, was cured by treatment.

CASE X.—CONCUSSION; STRABISMUS.

A man, æt. 26, having been struck down by a bag of sugar falling from a height upon his shoulders was rendered almost completely unconscious; within a few minutes consciousness partially returned, and he vomited freely. In this condition he was admitted into Guy's Hospital, being drowsy and roused with difficulty; in a few hours he became quite sensible, and complained of pain in the head; he was kept in bed, and cold lotions were applied to the seat of pain, and a mercurial purge administered. The pain, however, continued very intense, associated with a hot skin and contracted pupils, and upon the fourth day a *convergent squint* of the right eye was very marked. Gray powder and Dover's powder, in three-grain doses, were given three times a day, and in three days all these symptoms were much diminished, the fever was less, pupils less contracted, and the eyes were more tolerant of light; the strabismus also was improved. In another three days the squint, with all bad symptoms, had disappeared, and after a few weeks' residence in the hospital he left cured.

This secondary inflammatory action may, however, be more acute, and give rise to all the symptoms which an inflammation of the cerebral membranes is wont to produce.

SECTION II.

CONCUSSION OF THE BRAIN, COMPLICATED WITH SOME LESION OF ITS STRUCTURE OR EXTRAVASATION OF BLOOD.

Although there may be some difference of opinion amongst physiologists as to the question whether an alteration in the functions of a part necessarily involves any change of its structure, I think there can be none amongst surgeons or pathologists as to the fact, that in all cases of injury to the nervous centres, producing a suspension or alterations of their normal action, there is and must be some change or injury to the structure of the brain or spinal cord, although that change may be overlooked by the naked eye.

When we consider the delicacy of the structure of the nervous ganglia, and how little we even now know of the distribution of its fibres, or of their anatomical arrangement, it is not to be wondered at that the acutest pathological eye may at times be baffled in discovering any abnormal change, when the normal is not yet understood.

As the science of pathology advances, and the eye of the student learns how to observe, and what to look for, alterations of structure are observed which our ancestors never dreamt of, and which consequently would have been passed over. In cases of death from concussion of the brain there can be no doubt this mistake has often been made, and the cases are not rare, as described by authors, where death followed upon concussion of the brain, but no lesion of its structure had been detected.

I am not disposed to dispute the value of their observations, or to doubt the truthfulness of their descriptions, but I do believe that such cases are of exceeding rarity, if they occur at all; and that some change in the brain itself, or upon its surface, will generally be found if earnestly looked for. There will be some extravasation of blood, either upon its surface or within it; if upon its surface, it will be either upon or within the membranes, or within the meshes of the pia mater; and if the latter, some ecchymosis of the cerebral convolutions will generally be present. If the extravasation of blood takes

place within the structure of the brain, the clot will seldom be—as in an apoplexy—in one large mass, but it will generally show itself in small and numerous patches, varying from a pin's head to a pea in size.

I will now proceed to quote briefly some illustrations of these points, and will commence by quoting an example of concussion followed by ecchymosis of the brain.

CASE XI.—CONCUSSION AND ECCHYMOSES OF THE BRAIN, BOTH UPON ITS SURFACE AND WITHIN THE VENTRICLES.

A girl, æt. 4 years, having been knocked down by a pocket of hops falling from a height upon her, was taken up quite insensible, and brought to Guy's. She was admitted perfectly unconscious, in a comatose condition, and with stertorous breathing; this continued without any interval until her death, sixty hours after the injury; there were at the same time frequent twitchings of the limbs and rigidity of the muscles; the pupils also were fully dilated. After death the bones were found to be quite sound, and free from fracture. The brain was bruised all over, especially towards the anterior lobes, and upon its upper surface; and at its base the anterior and middle lobes were likewise ecchymosed. Blood also was extravasated at these injured spots. The fluid in the ventricles was of a pinkish colour, and the parts around were ecchymosed.

The case just quoted is a good illustration of concussion of the brain causing ecchymosis of its structure to a great extent, both externally and within the ventricles. It may, however, be found in all degrees, from the mere local bruise to the almost pulpy condition of the cerebral masses, as indicated by the case just given.

I shall now pass on to give an example of extravasation of blood upon the surface of the brain, accompanied with slight laceration of the brain-structure, as a result of concussion.

CASE XII.—CONCUSSION; EXTRAVASATION OF BLOOD UPON THE SURFACE OF THE BRAIN, AND ECCHYMOSES.

A man, æt. 31, when drunk, wrestled with a companion,

and was thrown violently against a curbstone upon his head. He was removed to a hospital in an insensible condition, where a scalp-wound, which was produced by the fall, was strapped up, and he was then carried home. The following day his consciousness partially returned, and he had a fit (apparently epileptic); and as this recurred upon the third day, his friends brought him to Guy's. He was admitted under the care of Mr. Coek, perfectly insensible, with contracted features, and an anæmic appearance. He had a hot skin and rapid pulse, his pupils were contracted, and there was great restlessness and slight delirium; a lacerated wound also existed over the left occiput. His head was shaved, and cold lotion was applied to it, a mercurial purge being ordered. Upon the next day, or upon the fourth after the accident, a severe epileptic fit took place, and returned every five or six hours till the evening of the fifth, the left side of the body being the most affected. During the intervals a semi-comatose condition existed, and the skin was bathed with perspiration; he could, however, be roused with difficulty, and answered questions quite rationally; the pupils were obedient to light.

Upon the seventh day he was much improved, and appeared more sensible. Upon the eighth day symptoms of delirium tremens showed themselves. Opium was freely given, but failed to produce sleep till the tenth day, after thirteen grains had been taken; he then slept twelve hours, and upon waking was more rational, and was evidently relieved. Opium was continued at intervals, and he appeared to improve gradually until the twentieth day, when he became very drowsy, and this passed on to a semi-comatose condition. He could, however, be roused, and answered questions. He remained in this condition, at times uttering a shrill sudden scream, and then relapsing into quietude. His pupils became contracted, and his fæces and urine passed involuntarily. In this condition he remained for seven days, being more or less restless; he then became quite sensible, and at the expiration of three hours died quietly.

His body was examined forty-six hours after death.

Upon the occiput there was a dry scabby wound, about the size of a crown.

Upon removing the scalp, several ecchymosed spots were

observed over the posterior part of the left parietal bone, but no injury to the bone could be detected. When the calvaria was removed, the dura mater upon the right side was baggy, quite clear and healthy. On dividing it, and exposing the whole surface of the brain, a layer of blood was found to be universally diffused over it, this layer being less upon the left side, and there principally in the meshes of the pia mater, and between the convolutions; but upon the right side there was a clot almost an inch thick, especially over the anterior and lateral lobes, passing downwards towards the base. The clot was shreddy, of a dull reddish black colour, and had evidently been effused for some days. On the posterior part of the left hemisphere a small portion of the convolutions was softened, of a red colour, and with an adherent clot; a similar state was also found upon the anterior lobe of the right side, evidently the result of *contre-coup*.

None of the sinuses or large vessels could be found injured. They all appeared healthy, as also were the minute capillaries.

The brain was firm, but congested, and the other viscera quite healthy.

In this case there was no doubt about the character of the accident, and there also was none as to the cause of death, extravasation of blood upon the brain and laceration of its structure having taken place as a result of pure concussion. The vessels were also found, after a careful examination, to be quite free from disease, forbidding the idea of an apoplexy having taken place.

If this had not been the case, and considerable disease of the cerebral arterics had been detected, such a doubt would naturally have arisen; and it is in such cases of extravasation of blood within or upon the brain, associated with an injury, that much difficulty is often experienced by medical jurists. It is true that where the vessels of the brain are diseased, a rupture of their coats, and, as a consequence, an apoplexy, is more likely to result from a slight injury than where those vessels are sound; and the following case is a good example of such an occurrence.

CASE XIII.—CONCUSSION ; DISEASED VESSELS ; EXTRAVASATION OF BLOOD INTO BRAIN.

A man, æt. 56, when descending a ladder, fell from a height of thirty feet, striking his head in the descent against a projecting wall. He was taken up quite insensible, and in this condition was admitted one hour after the accident under the care of Mr. Hilton. He was perfectly unconscious, with a slow, labouring pulse, stertorous respiration, and contracted pupils; the eyes rotated constantly in their orbits, and an abrasion existed on the left ear.

The following day, when addressed sharply, he partially opened his eyes. His pulse was rapid, and his urine flowed involuntarily from him. The second day his skin became hot, pulse more rapid, and peculiar spasmodic attacks of difficulty of breathing appeared, accompanied with some movements of his limbs. A few ounces of blood were taken from his left external jugular vein, reducing the pulse; but the patient rapidly sunk.

Forty-five hours after death the cranial bones were seen to be full of blood, but not fractured. The dura mater was found congested, with a thin layer of bloody serum beneath; the arachnoid was thickened and opaque; the pia mater infiltrated with semi-coagulated fibrin, easily separated from the convolutions. At the base of the brain the arteries were in shape, and quite rigid from disease, and in the substance of the hemispheres *were several points of extravasated blood, about the size of peas.*

The heart was hypertrophied, and the left valves thickened. The kidneys were coarse and granular.

There would be no difficulty in quoting other cases where doubts would be experienced in forming an opinion as to the cause of death. In this case, did the man fall as a consequence of an apoplexy? or was the extravasation of blood the result of the fall?

It is difficult to express an opinion upon such a point; but as it is not common for an apoplexy to take place from many vessels at the same time, and as in this instance such was the

condition, and as we fairly expect that a violent shaking of the head, or concussion, in a man the subject of extensive arterial disease, would be likely to produce rupture of the diseased vessels, and as a consequence multiple apoplexies, I am disposed to give my assent to the latter query.

Authors have described the occurrence of extravasation of blood external to the dura mater, between it and the bone, as a result of concussion of the brain. There may be some doubt as to the occurrence of such instances; at any rate, they are very rare. I have no notes of such a case, and will not therefore quote an example. The extravasation is said to be produced by rupture of one of the meningeal arteries, and there are no symptoms by which such an accident can be distinguished, that is to say, there are none which will enable the surgeon to diagnose the exact seat of the extravasation, whether it is within or without the membranes. To make out the fact that extravasation has taken place is not generally a task of difficulty.

As a rule, however, I am disposed to believe that in cases of rupture of a meningeal artery some fissure or fracture of the skull will be detected upon a careful examination—it may be only a fissure at the point of injury, but a fissure will be found. It is difficult to understand how a rupture of a meningeal artery running in a bone could take place without a fracture, but the authorities upon which such instances are given forbid any direct contradiction to the fact.

CHAPTER II.

FRACTURES OF THE CRANIUM.

The fact that fractures of the skull are in themselves of small consequence, as long as the cranial contents are uninjured or uninvolved, is now so well understood, that it needs no comments in these pages.

But it is seldom that such uncomplicated cases are seen in practice; the bones of the skull are of a firm and compact

structure, and any injury to them sufficient to produce fracture will, as a rule, cause what has been described as concussion of the brain. This complication is the simplest that can take place. It is true that that concussion may be associated with other complications, such as have been already described—as hæmorrhage upon the brain, or within its structure; laceration or bruising of the cerebral masses; and, as a secondary complication, arachnitis, or inflammation of the brain itself. But besides these there are other complications which are more frequently associated with or are peculiar to fractures of the skull, such as depression of bone, producing compression of the brain; extravasation of blood external to the dura mater, from rupture of the meningeal artery; injury to the membranes, or injury to the brain.

The subject of fractures of the cranium may consequently be divided into several classes, each of which is worthy of a separate consideration.

- A. Fractures of the skull unassociated with any encephalic complication.
- B. Fractures complicated with simple concussion.
- C. Fractures associated with extravasation of blood external to the dura mater.
- D. Fractures complicated with extravasation of blood upon the surface of the brain.
- E. Fractures associated with extravasation of blood within the cerebral structure.
- F. Fractures complicated with depression of bone.
- G. Fractures complicated with direct injury to the brain-structure.
- H. Fractures of the base of the skull.

A. *Fractures of the skull unassociated with encephalic complications* are no doubt of great rarity, for it is difficult to understand how a force can be applied sufficient to produce a fracture of the cranium without at the same time causing some concussion of the brain; this concussion may be very slight, and may be known

perhaps by only a slight confusion, thus escaping the observation of the surgeon, who sees the case generally after the lapse of some short period of time. Cases are not unfrequent where a fracture of the skull has been overlooked, the local contusion and the severe symptoms of concussion for a time masking the injury, the fracture being subsequently discovered when the swelling has subsided. Practically, however, this is not of very great importance, as it is not the mere fracture of the skull which causes danger, but the injury to the cranial contents.

An interesting case of incised wound of the skull may here be quoted, unassociated with any cerebral disturbance. It is as follows.

CASE XIV.—INCISED WOUND OF SKULL, INVOLVING ONLY THE EXTERNAL TABLE.

A labouring man, *æt.* 27, received a blow over the vertex from a broken sword; an extensive scalp-wound was the result, and a very evident incised wound in the upper portion of the frontal bone apparently involving only the external table, and uncomplicated with the slightest cerebral disturbance. The edges of the scalp-wound were brought together, and a steady convalescence ensued, without a bad symptom.

Fracture of the skull may take place over the frontal region; and involving the frontal sinuses, the primary effects of the injury may be chiefly manifested there, although the fissures may radiate more extensively; in these cases the brain itself may be uninjured and no cerebral disturbance take place. The following case is a good example of such an injury.

CASE XV.—FRACTURE OF THE SKULL, INVOLVING THE FRONTAL SINUSES; NO CEREBRAL SYMPTOMS.

A boy, *æt.* 6, having been knocked down by a horse and trampled upon, was admitted into Guy's Hospital, under the care of Mr. Birkett, with severe ecchymosis and swelling of the whole forehead, and an extensive scalp-wound and compound fractured

skull over the frontal region. The finger could be freely introduced into the wound and depressed bone felt; there were, however, no brain-symptoms, and the child was not even stunned by the injury.

Water-dressing was alone applied to the wound, and the child kept in bed. As the swelling subsided a fracture was clearly detected, radiating upwards from the primary seat of injury to the right parietal region. Convalescence steadily followed, and the boy left with the wound nearly healed six weeks after the injury.

B. The next class of cases which require illustration are much more frequent than the last; it includes all those examples of fractured skull *associated with simple concussion of the brain*; that is to say, where, after the receipt of the injury, the functions of the brain are for a time more or less interfered with or suspended, but which have a tendency gradually to return to their normal conditions.

CASE XVI.—FRACTURE OF THE SKULL; CONCUSSION;
SECONDARY INFLAMMATION, AND RECOVERY.

A child, æt. 4, twelve hours prior to her admission, fell out of a window upon her head; she was taken up quite insensible, bleeding from the right ear; vomiting speedily came on, and continued at intervals for some hours; about ten hours after the injury she became sensible, and spoke, asking questions, but as she relapsed into insensibility she was brought to Guy's. Admitted very drowsy, but could be easily roused; pupils natural and acting, skin moist and warm, pulse quick and of moderate power. A cold lotion was applied to the head, and two grains of gray powder ordered to be given every three hours.

For several days she was very restless and feverish, and upon the fifth day appeared to be quite blind; the pupils were dilated and refused to act. The mercurial was continued, and in another five days the child much improved, and the sight began to return. The child groaned a good deal during the night, but had perfect use of her limbs. After the lapse of

another week the sight appeared to be perfect, all fever had left, and the child's natural manner returned; a fracture was then discovered, passing over the frontal bone towards the squamous portion of the temporal, and the child left the hospital after a month's residence, convalescent.

This case is a good illustration of fracture of the skull complicated with concussion; this was followed by some inflammatory symptoms, apparently involving the optic nerves, causing temporary blindness. The treatment adopted was most successful; as the secondary inflammatory symptoms were subdued, sight returned, and a good recovery ensued.

The fact that a fracture of the skull was subsequently discovered is a point of interest, the severity of the cerebral complications demanding the chief attention, and the effusion which must have taken place in the line of fracture having for a time concealed the injury.

CASE XVII.—FRACTURED MASTOID PROCESS; LOCAL EMPHYSEMA; SECONDARY FACIAL PARALYSIS, AND RECOVERY.

A man, æt. 45, when at work received a blow behind the left ear from the handle of a crane; the accident was followed by insensibility for fifteen minutes, and when admitted, about half an hour after the injury, he was quite sensible. There was a scalp-wound over the seat of injury, and some local emphysema, passing upwards upon the side of the head, evidently indicating that the mastoid cells were opened; there was no discharge from the ear, or facial paralysis. Simple water-dressing was applied, and after three days the emphysema had disappeared. No bad symptom or anything abnormal showed itself till the ninth day, when he first complained of a noise in the left ear, followed upon the next day by deafness and facial paralysis. A blister was applied to the neck, and a mercurial, in the shape of Hydrarg. c. creta, gr. iv, twice a day. After a week these symptoms began to subside, and in a fortnight the facial paralysis had disappeared, and although he stayed in the hospital another month, he left well in every respect, excepting slight deafness upon the injured side.

In this case of compound fracture of the mastoid process slight concussion was produced by the injury; those symptoms rapidly subsided, together with the emphysema, which was an interesting complication. Upon the ninth day the deafness and facial paralysis must have been produced by some inflammatory action within the petrous bone, and although the treatment adopted proved of sufficient value to restore the facial nerve to its normal condition, the more delicate structure of the auditory failed to receive equal benefit, and some slight deafness was the result.

C. Fracture of the skull, associated with extravasation of blood external to the dura mater.

This form of injury will be best illustrated by the following case.

CASE XVIII.—FRACTURED SKULL; CONCUSSION; RUPTURED MENINGEAL ARTERY AND HÆMORRHAGE EXTERNAL TO THE DURA MATER; COMA, AND DEATH.

A man, æt. 49, when riding in a gig, was thrown out upon his head; the accident produced a scalp-wound over the left side of the vertex, and some insensibility; this speedily passed away, and he got up and walked for about half an hour. He then became confused and staggered; he went into a shop, and was supposed by the shopkeeper to be intoxicated, but as he gradually became quite insensible he was brought to Guy's. He was admitted under the care of Mr. Coek, perfectly unconscious and comatose, with dilated pupils, labouring pulse, and slow respiration; he very soon became convulsed, the right arm being the most so; this, however, in a few hours became paralysed. He remained in this condition for two days, and died comatose.

After death, upon removing the calvaria, a large clot of blood was seen lying upon the dura mater, proceeding from the middle meningeal artery; it was about two and a half inches in diameter, and more than one inch in thickness; it formed a globular tumour, and caused an extensive depression upon the left hemisphere beneath the parietal bone. The surface of the brain was healthy, but the pressure of the clot

had altered its whole shape, the longitudinal fissure being pressed to the right, and presenting a concavity to the injured side.

The skull was fractured in a vertical direction, the fissure passing from the middle of the left parietal bone to the jugular foramen. The bone was thick and spongy, whilst the bone at the base was in spots as thin as a wafer. This was the only injury.

This case scarcely requires any comment; it tells its own tale. A man is thrown out of his gig, and receives a scalp-wound and some concussion of the brain; in a few minutes these symptoms pass away, and he walks about; when reaction has become established the middle meningeal artery, which was torn through by the fall, pours out its blood; the man becomes confused and giddy, as if intoxicated; the effusion continues, pressing gradually upon the brain; at first it acts somewhat as an irritant, causing twitchings and convulsions of the limbs, but soon, however, by its pressure, it paralyses the brain, causing coma and death.

In any case presenting symptoms like the preceding, the diagnosis of extravasation of blood becomes tolerably certain; its exact seat, however, is another point. The fact that the man took two days to die would perhaps indicate pressure from above, as pressure upon the base causes more immediate paralysis of the respiratory nerves, and death therefore becomes more rapid.

If the extravasation had taken place within the arachnoid, the blood would have gravitated downwards to the base, and, as a consequence, would have destroyed more quickly; but, although it is not difficult to form an opinion as to the fact of hæmorrhage taking place, it is almost impossible to diagnose its exact seat, except in quite exceptional cases.

One of those is well represented by the following example.

CASE XIX.—FRACTURED SKULL OVER THE COURSE OF THE MIDDLE MENINGEAL ARTERY; EXTRAVASATION OF BLOOD EXTERNAL TO THE DURA MATER; OPERATION AND RECOVERY.

An engineer, æt. 16, when at work, received a severe blow

from a piece of wood, projected from a steam lathe, over his left temple. The accident produced total insensibility and an extensive scalp-wound. Admitted six hours after the injury, perfectly unconscious and comatose; the limbs seemed quite useless, and pupils dilated. There was much hæmorrhage also from the wound. Mr. Hilton, under whose care he was admitted, enlarged the wound, and found much blood effused beneath the pericranium, and beneath this were radiating fissures, through which blood oozed; there was also some slight depression. By the elevator three pieces of bone were removed, exposing a clot of blood external to the dura mater; this was taken away, and healthy membrane became visible. After this operation the patient became more sensible, pulse more rapid, and breathing less stertorous. For three days he remained in a very restless condition, taking no nourishment; but after that he gradually recovered, leaving the hospital cured.

In this case the character and position of the injury fairly led the surgeon to suspect a fracture, and with it a laceration of a meningeal artery. The blow was a sharp and sudden one, causing a local injury. The position of the wound was exactly the one where the middle meningeal artery was situated, and thus a fracture on such a site was likely to be associated with its rupture.

The correctness of the opinion was verified by the success of the operation, and the subsequent termination of the case justified both.

CASE XX. — COMPOUND COMMINUTED FRACTURED SKULL; HÆMORRHAGE, AND ABSENCE OF HEAD-SYMPTOMS TILL THE EIGHTH DAY; REMOVAL OF LOOSE BONE AND CLOT, WITH RELIEF TO SYMPTOMS; EXPOSURE OF DURA MATER; SUBSEQUENT EXFOLIATION OF BONE; GRADUAL RECOVERY.

Jessie N—, æt. 46, was admitted July 25th, 1858, under the care of Mr. Birkett, having a short time previously, when asleep with her head resting upon a pillow, been struck by her husband upon her head with the butt end of a large hatchet.

When admitted, there were three scalp-wounds on the left side of the head, from which it was said much hæmorrhage had taken place—the anterior one situated a little above the left eyebrow, a middle one over the temporal fossa; and a third over the left parietal tuberosity. With the finger the surface of the skull could be touched, and a fracture was discovered. She was in an almost unconscious state, but replied to questions, although in a low tone. The pulse was very feeble, but there were no indications of severe cerebral injury. Perfect rest was enjoined, and the wounds were covered with wet lint. She went on well, and upon the fourth day there were still no indications of cerebral injury, and the only complaint she made was of severe pain in the head. She replied to questions sensibly; the wounds had, however, assumed a sloughing aspect, and were dressed with the addition of a little nitric acid in the water.

Upon the eighth day the first cerebral symptoms made their appearance, the muscles of the upper extremities became convulsed, and the hands clenched, the *left* pupil was also more *dilated* than the right; she seemed light-headed, and did not reply to questions so sensibly as before; the pulse was slow and weak, and her expression was anxious. As these symptoms indicated local pressure of the brain at the seat of injury, Mr. Birkett, at 1 p.m., laid the two wounds into one, exposing the bone, which was seen to be extensively fractured in a radiating manner, and in parts depressed. By gentle manipulation two large pieces of bone were removed; one, the anterior piece, showed a larger surface of the external table and a small portion of the internal, whilst the posterior fragment showed a small portion of the external table, and a large surface of the internal; the internal table of this fragment contained the groove for a branch of the middle meningeal artery, and in one of the grooves the fracture extended.

When the two pieces of bone were removed, a large coagulum of blood was seen, which entirely obscured the dura mater, and when a thin plate of the inner table was gently elevated active arterial hæmorrhage took place, which immediately ceased when it was left alone. Mr. Birkett left this small loose portion of bone *in situ*, to be detached by natural processes. Upon the ninth and tenth days some hæmorrhage

took place, which was arrested by cold, and the removal of the coagulum. She gradually improved, having lost all head-symptoms after the operation; pulse and pupils became natural, and the wound healthy; and upon the eighteenth day the small piece of bone above mentioned was removed, as it was quite loose. Along its posterior border was half the groove for a branch of the middle meningeal artery, and towards its anterior border the whole groove for another arterial branch.

From this time all things went on well. Upon the seventy-fourth day she began to complain of a peculiar hissing sound or noise in the head, which distressed her much; she was still feeble, but gaining power. Subsequently to this several large pieces of bone were removed, and many small pieces, and the wound healed slowly by granulations from the surrounding integuments dipping into the hole in the cranium, and uniting with the surface of the dura mater.

Her general health gradually improved, and the wound healed; and, after eight months' residence in the hospital, she left cured, having lost seven square inches of the lateral cranial walls, or bone extending three and a half inches from before backwards, and two inches from above downwards.

Remarks.—This case is an admirable illustration of a severe local injury to the skull, uncomplicated with any general cerebral disturbance. Although the bone was most extensively fractured, and the middle meningeal artery torn through, there was but little injury to the brain itself, as manifested by the absence of all cerebral symptoms. The extensive fracture of the skull allowed the blood from the ruptured vessels to escape externally, and, consequently, early compression of the brain was prevented. Upon the eighth day such symptoms first appeared, the external escape of blood having been probably retarded by the formation of the clot, and the compression of the brain was thus caused. The relief afforded to such symptoms by the removal of the bone was very marked, all such disappearing after the operation.

The wisdom of leaving the small piece of bone involving the artery was well shown, and is an interesting point.

The absence of any subsequent meningeal inflammation was very fortunate, and probably the perfect rest and absence of all cause of excitement tended to prevent it; but more pro-

bably it revealed the fact that the brain itself was uninjured, the force of the blows having been expended upon the seat of injury.

The case is a most valuable one, as demonstrating to what an extent a local injury to the skull may take place, and a good recovery result.

D. *Fractures of the skull complicated with extravasation of blood upon the surface of the brain.*

This division of the fractures of the cranium, complicated with extravasation of blood upon the surface of the brain, is the most important and the most serious.

In the last cases, given to illustrate hæmorrhage external to the dura mater, the injury is generally a local one, produced by a sharp blow, causing fracture and laceration of a meningeal artery, and the brain, as a whole, is uninjured; but in these which we are now about to consider the extravasation of blood is generally only a symptom of a more serious injury, namely, a laceration of the cerebral structure.

The complication is generally found in patients who have fallen from a height, or have received a very powerful blow from a blunt instrument; as a result, the whole brain is powerfully shaken or concussed, and its delicate structure, being forced against some of the many projecting points of bone within the base of the skull, becomes bruised and lacerated, and, as a result, hæmorrhage takes place. This hæmorrhage may be associated with rupture of the meningeal artery and extravasation of blood external to the dura mater, as it may be with laceration and ecchymosis of the interior of the brain; the injury to the brain and seat of the hæmorrhage is generally at the base, and is produced by what is called *contre-coup*.

CASE XXI.—FRACTURE OF SKULL; EXTRAVASATION OF BLOOD AND CONTUSED BRAIN FROM CONTRE-COUP.

A man, æt. 46, having been thrown off his horse, was taken

up insensible and with a severe scalp-wound over the left temple. In this condition he was admitted into Guy's Hospital, under the care of Mr. Birkett. No fracture could be detected. He was perfectly unconscious and unable to move, the left pupil was dilated and fixed, respiration labouring, pulse slow, and in this condition he remained till he died, sixty hours after the accident.

Necropsy.—After death, when the calvaria was removed, a fissure through the bone was detected at the seat of injury, passing upwards; and, upon removing the brain, it was seen to descend along the middle fossa, through the sphenoid bone, to the carotid canal. Upon removing the dura mater a layer of blood was seen covering the brain, but more upon the right side than the left, and the base was covered. This proceeded evidently from a severe contusion upon the middle lobe of the right side; the brain at this part was pulpy, but at the seat of injury (left side) it was quite uninjured; all other parts of the brain were sound, and the other viscera were healthy.

This case is a good example of injury to the skull, and extravasation of blood as a result of injury to the brain by *contre-coup*. It is this injury to the cerebral structure which is always to be feared in severe falls or blows; and if the part itself, corresponding to the force, is wounded, the opposite or base of the brain is, as a rule, likewise involved. This fact always makes the diagnosis of injuries to the skull a task of difficulty, and the prognosis always unfavorable.

In any injury, however, to the head, which may produce a violent shaking of its contents, extravasation of blood rarely takes place in any part; and where it is associated with fracture, hæmorrhage external to the dura mater is frequently found. Whenever fracture of the skull takes place, some hæmorrhage in the line of injury is generally seen; but it may be to only a very limited extent, and it is only when a trunk of a large vessel has been injured that the brain becomes compressed, and a fatal termination is to be expected from that cause.

CASE XXII. — FRACTURED SKULL; CONCUSSION OF THE BRAIN; ECCHYMOsis BY CONTRE-COUP; EXTRAVASATION OF BLOOD AT BASE, AND EXTERNAL TO THE DURA MATER.

A woman, æt. 25, when cleaning windows, fell backwards, from a height of twelve feet, upon her head. She was taken up quite unconscious, bleeding from both nostrils, and immediately admitted into Guy's, under the care of Mr. Hilton. She was insensible, but moaning and restless; pupils were dilated and insensible, and there was some subconjunctival ecchymosis. The pulse was small and irregular, 130; skin cold, but no paralysis; upon examining the right temple, upon firm pressure, there was evidence of fracture. She remained in a very restless condition for twelve hours, refusing to answer questions, but the next day she became more sensible; she complained of pain in her head, and was very restless, and moaned frequently; her breathing was quick, and pulse rapid.

The next day she was so violent that a jacket had to be put on to prevent injury; she passed her urine involuntarily, and became comatose, dying in that condition fifty-nine hours after the accident.

Upon examining the body the skull was found extensively fractured, fissures radiating from the seat of injury downwards towards the base of the skull. Blood was effused external to the dura mater in the middle fossa, particularly towards the base; the middle lobes of the brain were much bruised, and covered with extravasated blood.

In this case we have well illustrated the results which very frequently follow a fall upon the head from some height. The skull is fractured, and the fissures pass downwards to the base, as indicated by the subconjunctival ecchymosis. The accident is followed by a suspension of the functions of the brain; but consciousness returns, and with it reaction, attended with intracranial hæmorrhage; this hæmorrhage causes pressure, and consequently, insensibility, and, after a few hours, coma and death.

The brain, however, does not escape uninjured. The severe jar produced by the fall causes ecchymosis of its structure at the base by *contre-coup*, and with it extravasation of blood, the two sources of hæmorrhage combined proving sufficient to cause a fatal termination.

The following case is also one of secondary hæmorrhage upon the brain. No post-mortem examination was allowed, consequently there may be some doubts upon the case.

CASE XXIII.—FRACTURED SKULL; SECONDARY HÆMORRHAGE;
DEATH.

A man, having fallen from a height upon his head, was taken up partially insensible, and admitted under the care of Mr. Cook. He was to a certain extent conscious, with a slow respiration, and endeavoured to answer questions. There was no paralysis, but there was some bleeding from both his ears. There was an extensive wound over his right parietal bone, and evident fracture, but no depressed bone; he gradually became quite sensible and spoke freely. He was left at night quite comfortable, but in the morning was found with paralysis of the *left* side, and also of the *right* facial nerve; he was heavy, and roused with difficulty, opening his eyes when spoken to with a loud voice, but he did not speak.

He gradually became more unconscious, and at last comatose, dying sixty-two hours after the injury.

Although the exact condition of parts could not subsequently be demonstrated, the history of the case is one which tolerably clearly tells its own tale.

The man from the fall received a compound fractured skull, and concussion of the brain primarily took place; from this the man partially recovered, and when reaction had fairly set in, and the circulation was freely established, a meningeal artery, which had no doubt been lacerated at the time of injury, poured out its contents, and compression of the brain, coma, and death, followed.

The paralysis of the *left* side and of the *right* facial nerve indicated an extravasation upon the right side (the seat of injury), and also that the extravasation was situated in the

middle fossa, involving the portio dura or seventh nerve; and, indeed, in such cases, the extravasation is almost always towards the lower part of the skull, although there may be some upon the upper surface of the hemisphere; and it is this fact which tells so much against the operation of trephining, the surgeon being unable to reach the most important clot, viz., that at the side and base of the skull, although by the operation he may relieve the pressure upon the upper surface.

E. Fractures associated with extravasation of blood within the brain-structure.

When a patient receives any severe injury to the head, sufficient to cause fracture, there can be no difficulty in understanding, from the cases already quoted, that at times blood should be extravasated into the substance of the brain, and the interior of the brain lacerated from the severity of the concussion.

In the following pages cases will be quoted to exemplify such injuries, and they form some of the most serious which come before our notice.

In instances already quoted ecchymosis of the walls of the ventricles has been clearly indicated, and in the following case a more exaggerated example of intracerebral injury will be made known.

CASE XXIV.—FRACTURED SKULL; EXTRAVASATION OF BLOOD
EXTERNAL TO BRAIN AND WITHIN VENTRICLES, WITH
LACERATION OF CEREBRAL STRUCTURE.

A man, æt. 52, was found by the side of the Surrey Canal by the police, and believed to be very drunk: he was taken to the station-house, and kept there for two hours; but as his insensibility became gradually worse, and at last perfect, he was brought to Guy's. He was, when admitted, quite unconscious and paralysed; his respiration was stertorous, pulse slow and labouring, and pupils dilated. Upon examining the head, a ridge of fractured and depressed bone was felt over the occiput, beneath an extensive bruise. In one hour he died.

After death, upon examining the body, severe contusions

were seen upon his loins, sacrum, scapula, arm, dorsal aspect of his hand, and also over the occiput, where blood was freely effused.

The skull was found to be extensively fractured in the occipital region; the occipital bone was loosened, and the suture separated; some of the serrated edges were broken off, and the bone could easily be moved upon the parietal. The interstices of the fracture were filled with blood.

Upon removing the calvaria the dura mater was found to be entire, but some blood was extravasated beneath the fracture. The left hemisphere of the brain was covered with blood, and this passed downwards to the base.

The middle lobes of the brain were extensively lacerated and pulped, being covered with extravasated blood. This blood extended inwards into the ventricles, which it filled.

The blood-vessels were healthy; kidneys slightly granular.

The above case is one of great interest, the absence of any history as to the cause of the accident and the extensive amount of injury, alone marking it out for observation.

There was no doubt that the man had received a severe blow upon the occiput, whether by an instrument or simply from a fall may be a question; the numerous ecchymoses upon other parts of the body probably indicated that the former was the cause, and that upon the dorsum of the hand pointed to a scuffle, and a blow to make the sufferer leave go his grasp. The police, of course, were quite innocent in the matter, however much these points were against them.

The early symptoms which led the police to regard the man as intoxicated is of importance, as it appears that the symptoms of commencing and early extravasation often give rise to such an error; and when the surgeon hears such a history, and the patient soon becomes insensible and comatose, internal extravasation, with injury to the surface of the brain, may fairly be suspected.

The diagnosis is of scientific interest, although, practically, little can be done. The surgeon must, in these cases, really fold his hands and watch the succession of symptoms, and with them the too certain death of the victim.

CASE XXV.—FRACTURE OF THE BASE OF THE SKULL; CONCUSSION, AND LACERATION OF THE SEPTUM LUCIDUM, WITH ECCHYMOSIS OF THE VENTRICLES; EXTREME EMACIATION, ARACHNITIS, AND DEATH.

A man, æt. 37, when working upon the railway, received a severe blow upon the *right* temporal region from the buffer of an engine. He was taken up quite insensible, and admitted into the hospital with a cold skin, slow pulse, labouring respiration, and contracted pupils; no fracture was detected, but *right* subconjunctival hæmorrhage indicated a fracture at the base; after a few hours reaction set in, with slight delirium. The following day he was quite quiet, and breathed calmly; skin was warm; pulse 85, and full. The second day he became more sensible, answering questions, and paralysis of the *left* facial nerve was observed. Hyd. c. Cret. gr. ij, c. P. Dov. gr. v, were ordered three times a day. He went on without any change till the thirteenth day, being sensible, and asking for what he wanted; no paralysis existed, except in the left face; pupils were natural; skin moist, and pulse regular; but upon the thirteenth day he complained of feeling sick, but not vomiting. His secretions were good, and he took food in moderate quantities, but had emaciated most rapidly. On the fifteenth day, he became slightly delirious at night; on the sixteenth, his urine passed away involuntarily; seventeenth, very restless, and complained of headache; eighteenth, subsultus tendinum, quick respiration; and on the twentieth he gradually sank, quite sensible, and paralysed only in the face.

After death, upon removing the scalp, no fracture was visible. On taking the calvaria off, the dura mater appeared quite healthy, the two layers of the arachnoid were adherent in five places, and the visceral layer was somewhat opaque; the pia mater was congested, and the convolutions of the brain wasted.

The ventricles of the brain contained double the normal amount of fluid, and the floor of the right presented a patch of ecchymosis; the septum lucidum was ecchymosed and lacerated for one inch, laying the two ventricles into one.

The posterior extremity of the cerebral hemisphere was

ecchymosed, particularly at the left side, and the anterior extremity of the right was slightly so, and beneath it the skull was fractured. The base of the skull was extensively fractured; the line extended from the right anterior inferior angle of the parietal downwards towards the frontal, across the orbital plate and posterior portion of the crista galli, through the left orbital plate and interior table of the frontal bone forming the posterior wall of the left frontal sinus. The frontal sinus contained blood, as also did the right orbit.

There was no injury seen to the left ear.

The lungs were partially hepatized, with small pyæmic abscesses. Bronchi filled with tenacious mucus. The other viscera were healthy.

The chief interest of this case is in the form of injury to the brain, the severe concussion produced by the blow upon the side of the head causing laceration of the septum lucidum; the extreme emaciation of the patient is also a point worthy of notice.

The character of the injury, associated with subconjunctival extravasation of blood, most positively indicated fracture of the base in the anterior fossa; and the laceration of the surface of the brain at the point opposite to the injury by *contre-coup* was clearly illustrated.

The diagnosis of the form of injury to the brain was of course obscure, as it too generally is; but pathologically the case is one of some interest, and well illustrates a laceration of the interior of the brain from severe concussion.

F. Fractures of the skull associated with depression of bone.

We now approach the consideration of a class of cases which are very marked in their character, and much more satisfactory to the surgeon, as in many cases, by the application of his art, he is enabled to confer considerable advantage upon the victim of the accident.

It includes all those cases of fracture of the skull associated with depression of bone, but uncomplicated with any injury to the dura mater or brain beneath. The accident is generally produced by a *sharp* blow, or fall upon some *projecting object*.

It may be followed by symptoms of concussion, which are of a slight character, or with others of compression of the brain; but neither the blow nor fall has been sufficient to cause more than a local injury, the brain itself not having been sufficiently shaken to lacerate or bruise its structure, and, as a consequence, extravasation of blood has not taken place. In some rare examples of compression of the brain from depressed bone no cerebral symptoms are produced; in these instances it is needless to add that the surgeon's art is not required, as by interference he may produce the very complication he seeks to avoid, viz., encephalic injury.

The following cases will illustrate the subject.

CASE XXVI.—FRACTURE OF THE SKULL; CONCUSSION, AND DEPRESSED BONE; NO SIGNS OF COMPRESSION; RECOVERY.

A boy, æt. 14, having fallen out of a cart upon his occiput, was at once admitted into the hospital, partially unconscious, with cold skin and other symptoms of slight concussion, and also a distinct fracture of the occipital bone and marked depression of bone about the size of a florin.

In a few minutes he completely recovered his consciousness, and appeared quite natural. No one symptom of compression followed, and he left the hospital, after a short residence, apparently none the worse for the accident.

CASE XXVII.—COMPOUND FRACTURED SKULL AND DEPRESSION; ONLY SYMPTOM A FEELING OF WEIGHT UPON HEAD, RELIEVED BY REMOVAL OF BONE; RECOVERY.

A boy, æt. 16, having received a sharp blow upon the head with a piece of iron, was admitted into Guy's, under the care of Mr. Birkett, with a compound fracture of the skull over the anterior superior angle of the left parietal bone, and depression, the bone being somewhat comminuted. There were no symptoms of concussion or compression, and all the boy complained of was the feeling of a great weight upon the head; this symptom disappeared at once upon the removal of the pieces of bone by forceps, and a steady convalescence followed.

The two cases just quoted are admirable illustrations of

simple and compound fracture of the skull, attended with depression, but not sufficient to cause any suspension of the cerebral functions, and also point out the practice which is suitable to each. In the former case no other means than rest and preventive measures were called for; in the latter the careful removal of the loose bone by means of forceps was all that was required.

In the case which I am about to quote the comminuted bone produced some symptoms which were immediately relieved by its removal, and a good recovery took place.

CASE XXVIII.—COMPOUND FRACTURED SKULL; CONCUSSION, FOLLOWED BY CONSTANT VOMITING AND PAIN IN HEAD, RELIEVED AT ONCE BY REMOVAL OF BONE UPON THE FOURTH DAY; RECOVERY.

A boy, æt. 9, having fallen off a ladder the distance of four feet upon his head, was rendered partially unconscious; after two hours this state of concussion passed away, and he walked home unattended. His parents examined his head, and found a severe scalp-wound over the left parietal bone. In a few hours he became sick, and vomited his meals; his head also began to ache; these symptoms continuing for *four* days, he came to Guy's.

When admitted, he complained of great pain in the head, more particularly at the seat of injury. There were no other cerebral symptoms; his pupils, pulse, skin, &c., being quite natural. He felt, however, sick, and vomited everything he took.

Upon examining his head there was a scalp-wound over the left parietal bone, and some comminuted depressed bone; this bone was immediately removed by means of forceps, and the headache at once disappeared, vomiting ceased, and he recovered without one bad symptom.

The cases of fractured skull already given associated with depressed bone were unmarked by any symptoms which are generally regarded as indicating pressure upon the cranial contents. The following examples are of another description, and were all complicated with evident symptoms of compressed brain.

CASE XXIX.—COMPOUND FRACTURED SKULL; DEPRESSED BONE; TREPHINING AND ELEVATION; RAPID RECOVERY.

A man, æt. 20, received a blow upon the head from a falling crane; he was rendered completely unconscious, and brought to Guy's. When admitted he was partially insensible, but could answer when spoken to. There was no evident paralysis, but his pupils were dilated and fixed, and his respiration laboured; pulse also slow. Upon the head was a large scalp-wound, over the right parietal bone, and with evident, depression of bone. As the symptoms did not leave him, Mr. Poland trephined the bone about one hour after the accident and raised the depressed portion. A rapid recovery took place, the symptoms present were immediately relieved by the operation, and fifteen hours after he was perfectly natural; he recovered without one untoward symptom, not even a headache, leaving the hospital six weeks after the injury, quite well.

CASE XXX.—COMPOUND FRACTURED SKULL AND DEPRESSION; TREPHINING, AND A RAPID RECOVERY.

A man, æt. 39, when at work received an injury to his head from a brick falling from a height. He was rendered completely unconscious, and brought to Guy's.

When admitted he was very drowsy, although partially conscious; his respiration was slow and labouring; pulse full, but slow; no distinct paralysis was present, and his pupils were dilated.

There was a scalp-wound over the posterior and superior angle of the left parietal bone, and a wedge of bone driven in; it was quite fixed, and could not be removed without the application of the trephine. This was done by Mr. Birkett, and many pieces of broken bone were removed. It was found that the inner table of the skull was extensively fractured, much more so than the outer; the dura mater, however, was uninjured. All bad symptoms rapidly disappeared; upon the eighteenth day erysipelas attacked his head, without, however, causing any ill effects, and in nine weeks after the accident he left convalescent.

CASE XXXI.—FRACTURED SKULL AND DEPRESSION; COMPRESSION OF THE BRAIN; ELEVATION OF BONE BY MEANS OF THE TREPHINE; RAPID RECOVERY.

A boy, æt. 12, having fallen from a tree upon the edge of a brick, fractured his skull at the junction of the posterior superior angle of the parietal bone with the occipital. He was taken up insensible, and admitted into Guy's under Mr. Coek. He was quite unconscious, and incapable of moving; pupils were dilated and fixed; pulse and respiration slow and labouring. There was a scalp-wound, and very evident local symptoms of depressed bone, with compression of the brain. Mr. Coek at once applied the trephine, and elevated the depressed bone. The boy soon became conscious, and without any interruption by a bad symptom rapidly convalesced.

From the consideration of the previous cases some valuable conclusions may fairly be drawn.

First. That fractures of the skull, although attended with depressed bone, if uncomplicated with any severe concussion of the brain, and therefore with any cerebral injury, and if the dura mater remains uninjured, as a rule, terminate successfully.

Secondly. That simple fractures of the skull, associated with depression, if unattended with marked symptoms of compression, are to be left alone.

Thirdly. That compound fractures of the skull, attended with depression and comminution of the bones, are to be treated by the removal of the loose portions; and if symptoms of compression exist, and the bones cannot be removed without the use of the trephine, that instrument is to be employed, although with great care, as it would appear that severe injuries to the cranium may recover, as long as the membranes are entire and the cerebral hemispheres are uninjured; but a totally different conclusion will be manifested when we come to consider the next class of cases, where the brain itself has not escaped the injury.

In all the cases of depression of bone the injury has been produced by a sharp blow, the instrument acting locally only

upon the injured cranium; and it is remarkable to what an extent the skull may be fractured, and a recovery take place, if the membranes and brain are not primarily injured, and no subsequent inflammatory mischief supervene. A simple local injury, with severe general concussion, is much more serious than an extensive local one, uncomplicated with concussion or injury to the brain. The dangers of all injuries to the skull depend entirely upon the mischief to the cranial contents, and severe concussion is likely to produce some laceration of the cortical structure of the brain by the *contre-coup*, or some laceration of the more delicate central portions, and, as a result, extravasation of blood is sure to follow, or inflammation of the brain-substance and its membranes. These complications are produced by severe shocks of the brain, from whatever cause: falls from a height, blows from blunt instruments, or any similar injury; and it is from these causes that cerebral injuries are so fatal.

The mere local injury is of comparatively slight consequence, if it is confined to the spot, and the last few cases quoted illustrate the truth of the remark, and in all the injury was caused by a fall upon, or blow with, some sharp instrument.

G. *Fractures complicated with direct injury to the cranial contents.*

In the remarks with which I have concluded the last section of this subject, I asserted that the dangers of all injuries to the skull depend entirely upon the mischief caused to the cranial contents; that extensive intracephalic complications may be produced by slight external injuries; and also that severe external injuries, unassociated with intracephalic mischief, may generally terminate favorably.

In the present section I proceed to show how powerfully nature resents any scratch or injury to the dura mater, and how even any bruise of the brain-structure, and much more how any severe injury to it, is followed by an almost certain death. Any mischief to the cranium itself, uncomplicated with these injuries, may be recovered from; but with them they are most dangerous, and the prognosis is always unfavorable.

CASE XXXII.—COMPOUND FRACTURED SKULL, WITH DEPRESSED BONE; ELEVATION; DURA MATER FOUND INJURED; ENCYSTED ABSCESS IN THE BRAIN; DEATH.

A boy, æt. 14, having received a severe blow upon the head from a hammer which a fellow workman was swinging previous to dealing a heavy blow upon a rivet, was admitted half an hour after the accident into Guy's, under the care of Mr. Birkett. He was collapsed and retching violently, but not vomiting. Insensible, with contracted pupils, and a pulse scarcely to be felt. There was some bleeding also from the left ear.

Above the *left* ear there was a wound, and a depressed circle of bone. This was at once raised by an elevator, and the dura mater was seen to have been scratched. After the operation the boy became more sensible; he passed, however, a very restless night, at times uttering a loud scream, and constantly raising his hand to the seat of injury. These symptoms of arachnitis increased, and upon the fifth day there were spasmodic twitchings of the *right* face and paralysis of the *right* arm; skin very hot, and pulse rapid and very hard. He was bled to six ounces with decided benefit. The acute inflammatory symptoms partially subsided, and upon the seventh day the skin was cool, and the spasm of the facial muscles was less, and there was some power in the right arm. From this time he steadily improved, all paralysis leaving him, and the wound gradually healing; he took his food well, and although not disposed to talk, was quite sensible.

Upon the thirtieth day he was seized with pain in the head and vomiting, but after a few days this passed away; upon the fortieth the pain again returned, and gradually became worse till the forty-fifth; he then became very drowsy, although he took his food well. He seldom moved, although there was no paralysis; pupils were quite natural. He again began to improve, and his manner became more natural; he apparently was daily improving, when upon the seventieth day he became very drowsy and refused food; skin moist, and pulse quick and feeble; pupils normal. There was no paralysis. In this condition he remained, apparently merely sinking, and died upon the seventy-fifth day.

Autopsy.—On the left side of the head, at the seat of injury, was a recently healed wound, two inches in length, with only a slight exudation from the cicatrix; around the cicatrix the tissues were soft, and somewhat bulged outwards. Upon removing the scalp, this bulging was found to be due to a projection of the brain, or to a hernia cerebri, and therefore, upon cutting it through on a level with the surface of the skull, a considerable portion of brain-structure was removed, contained in its covering of dura mater. These parts were firmly united to the scalp and cicatrix, and were cut out together. They were discoloured, and contained inflammatory products, but were not soft, and nothing like pus was discoverable. It was impossible to say whether the dura mater had been torn or not at this spot, as it was so intimately adherent to the cicatrix that the fact was not ascertainable.

The focus of the injury upon the skull was the middle of the lower part of the left parietal bone; at this spot the bone was comminuted; some pieces were loose and others gone. The opening through which the brain protruded measured two inches and a half in diameter, and reached to the eminence in the centre of the bone; the lower border was formed by loose pieces of the parietal bone, united and firmly bound together by fibrous tissue; the meningeal artery had just escaped laceration. At the anterior part of the wound was a small piece of bone half an inch square, which was firmly fixed upon the anterior inferior angle of the parietal bone; the periosteum had disappeared, an ossifying fibrous tissue was formed between them, and the two pieces were fast growing together. A fissure passed forwards from the opening round to the other side of the head. The middle fossa of the base was broken into several pieces, and the roof of the orbit fissured.

These parts were firmly fixed and were rapidly uniting. The connecting substance between the fractures was of a hard bony tissue, and for an inch or more on either side of the fractures the inner surface of the skull was covered with minute bony granulations, producing an uneven rough surface; the bone too was highly vascular. The dura mater was firmly adherent to the bone near the hernia cerebri at its lower portion; internally it was firmly united to the brain for a considerable distance all around. Upon stripping off the membranes, the

arachnoid being greasy from an inflammatory exudation, the surface of the brain appeared quite perfect, except where the hernia had been cut off; it was flattened, so that all trace of a subarachnoid space was obliterated, the vessels of the pia mater appearing to ramify upon a smooth surface. The cerebral hemispheres were not symmetrical, the left being the largest; the corpus callosum was bulging outwards, and upon being cut into to expose the ventricles nearly three ounces of clear serum escaped. The septum lucidum was destroyed, and the central parts were soft. The left corpus striatum and thalamus were thrust upwards into the ventricle. At the anterior part of the left hemisphere, and in front of the fungus, was a large encysted abscess, about the size of a hen's egg; its walls were dense and tough, and it contained pus of ordinary consistence and colour, and free from all smell. The cyst was perfectly globular, one eighth of an inch thick, and consisted of a tough semi-transparent membrane of nucleated fibres; the interior was smooth and hard, and not unlike the surface of an old vomica in the lung; externally it was distinct from the brain-substance, and the latter fell off it by gravitation when it was held up. The brain-structure round it was of various hues, between a dead white and brown, several ochry patches being seen around.

The abscess was covered in by at least an inch of brain-structure.

The base of the middle hemisphere showed evident symptoms of old contusion and extravasation; the convolutions were of an ashy colour, from effused blood.

In this exceedingly interesting case of compound fractured skull, followed by an encysted abscess of the brain, it is curious to observe how the process of repair had gone on, even to the healing of the external wound and union of the fractured bones. The cerebral injury was doubtless the cause of death; and although this case invites comments, I must forbear, as my object in quoting it is merely to show a result of a local injury to the brain associated with compound fracture.

The primary results of the accident were very lasting; and the symptoms of arachnitis well marked. The benefit of venesection was well illustrated by the gradual subsidence of all symptoms of inflammation of the membranes.

The inflammatory changes going on in the hemisphere producing the abscess had probably been progressing for some time, and the uncertainty and irregularity of the symptoms well displays the insidious character of such a complication.

CASE XXXIII.—FRACTURED SKULL; DEPRESSED BONE; LACERATION OF THE DURA MATER AND ECCHYMOSIS OF THE BRAIN; ARACHNITIS, AND DEATH.

A boy, *æt.* 7, in a quarrel with his mother received a blow upon the left parietal bone from the end of a poker which she threw at him; no symptoms appeared after the accident, and he went about as usual, but upon the second day, or about forty-eight hours after the injury, he became drowsy, and was consequently brought to the hospital. He was admitted partially unconscious, with a hot skin, contracted pupils, and evident early symptoms of arachnitis; there was also a punctured wound of the scalp, with depressed bone, over the left parietal bone. Mr. Cock trephined the part and raised the depressed bone, which was quite loose and driven in. The membranes were torn through, and brain-matter showed itself. The symptoms, however, continued, and he died comatose three days after his admission, and the fifth after the accident.

At the post-mortem examination, brain-matter was seen protruding through a small circular hole in the left parietal bone. Upon removing the calvaria, acute purulent arachnitis was seen covering the whole brain, and extending downwards to the base, which was equally involved.

The brain itself corresponding to the wound was ecchymosed and soft; in other parts it was healthy and uninjured. The other viscera were healthy.

In the cases just quoted fracture and depression of bone were produced by a direct blow, accompanied with injury to the dura mater and brain at the seat of fracture alone; there was no great shaking or concussion of the brain to cause laceration of its structure and extravasation, but a purely local injury. Arachnitis and softening of the brain, where bruised, followed, and with it the death of the patient. Such an inflammation is almost a constant consequence of any real

laceration of the membranes, or of the brain-structure, when ever it occurs, either from direct injury, as in the case just quoted, or in others produced by a severe concussion by *contrecoup*.

It remains to quote an example or two of extreme local injury to the brain, followed by the same arachnitis and death.

CASE XXXIV.—COMPOUND FRACTURED SKULL ; ESCAPE OF
BRAIN-MATTER ; ARACHNITIS, AND DEATH.

A railway guard, æt. 34, when travelling in a third-class railway carriage, lent forwards out of the window and received a blow against an archway, when the train was in moderate motion and about to stop. He got out of the carriage and walked into the station, and was at once brought to the hospital. He was admitted without a brain-symptom, and perfectly rational, with extensive wound over forehead, and comminuted fracture of the frontal bone ; the brain-substance was also freely exuding. Some dozen or more pieces of bone were removed by Mr. Forster, and water-dressing applied to the wound. He soon, however, became drowsy, and this steadily passed on to coma, followed by marked symptoms of arachnitis, and death upon the fifth day.

Upon removing the calvaria, a round hole, the size of a crown, was seen in the frontal bone, the inner table being fractured much more extensively than the outer. The frontal sinuses were opened, and the fracture extended through the ethmoid bone, and *longitudinally* through the body of the sphenoid and basilar process of the occipital to the foramen magnum.

Beneath the opening in the frontal bone the dura mater was torn through, and brain-matter, mixed with blood and lymph, freely exuded.

Upon removing the membranes no pus was seen beneath, but the brain was contused and pulpy, particularly at the anterior edge of the *right* lobe, and this softened condition extended into the medullary substance. The *left* lobe was less contused, but in one spot the brain was breaking up, and in another blood had been effused.

Upon the right side of the brain was acute arachnitis, with lymph completely covering the arachnoid.

The ventricles were healthy, and also the viscera.

This instance well proves to what an extent the brain-surface may be injured, and the functions of the brain left undisturbed, for as long as the central ganglia are uninvolved the vital functions are not materially affected. The subject of the injury in the case just quoted was not rendered even unconscious by the violence done to the anterior portion of the brain, and it was not till secondary inflammatory mischief appeared that any marked disturbance of the cerebral functions became manifest.

This secondary inflammation is the one point always to be feared in all injuries to the brain or its membranes; it may follow a slight concussion or the severest injury; and it is from such a complication that the majority of injuries to the cranium and its contents terminate fatally.

CASE XXXV.—COMPOUND FRACTURED SKULL FROM A PISTOL-SHOT WOUND; DESTRUCTION OF THE UPPER SURFACE OF THE CENTRAL HEMISPHERE; SECONDARY INFLAMMATION OF BRAIN AND ITS MEMBRANE; DEATH.

A man, æt. 35, having for some years shown some symptoms of insanity, attempted suicide by firing a loaded pistol off close to the right temporal region. He was admitted into Guy's, under the care of Mr. Birkett, soon afterwards, with a lacerated scalp-wound over the right temple, and fractured skull; the patient was quite sensible, and besides the local injury there were no symptoms of injury to the brain. Upon the day following some slight febrile symptoms appeared, but still no cerebral disturbance; upon the second day, upon examining the wound, a sharp edge, previously regarded as being bone, was found to be the edge of a bullet; this was extracted, and found to be almost separated in two; one of the cut surfaces was jagged and the other smooth, so it appeared that it had been fired against a sharp edge of the fractured bone, and this caused its separation. As it appeared probable that some loose portions of bone might be injuring the brain, the trephine was

applied, and some small pieces of bone removed. The dura mater was then seen to be lacerated and brain injured.

On the third day the man was somewhat drowsy, although quite intelligent; febrile disturbance still existed; pupils natural. On the fourth day he was attacked with two different seizures of general convulsions and obstinate hiccough; these passed away, and left him drowsy, but sensible. On the fifth day he was more dull, and pupils were dilated. On the sixth he became quite sensible, speaking to his dresser, and there was no paralysis; coma, however, came on, and death in one hour.

Autopsy.—On the right temple there was a wound three inches long, and the edges were sloughing. Upon removing the scalp, a brown decomposing mass protruded through the bone. This opening was of an oval form, an inch and a quarter long by three quarters of an inch broad, including a small piece of the anterior inferior angle of the parietal and frontal bones just above the sphenoid.

The laceration of the dura mater could not be well defined, owing to the sloughing which had taken place. The brain beneath the injury was of a brown and greenish colour, in fact, only a slough, within which was a small loose piece of bone about the sixth of an inch in diameter; upon dividing the hemispheres, nearly the whole of the right was sloughing and infiltrated with blood, involving the anterior and outer walls of the lateral ventricles, and the internal surface was stained with blood. The corpus striatum and thalamus were uninjured.

There were some small pyæmic abscesses in the lungs as well as in the liver.

Like the last case quoted, we find that a considerable local injury to the brain-substance, even with loss of cerebral material, was unaccompanied with any marked disturbance of the cerebral functions; and, like the last, the fact may be accounted for by the central nervous ganglia and base of the brain being left comparatively sound.

In both, however, secondary inflammation followed in the injured parts, and subsequently softening and extensive destruction; in this last example, however, the mind was clear to about one hour previous to death. The convulsions upon the

fourth day indicated meningeal complications, and the hiccough is a symptom worthy of remark, as it is not an unusual symptom of cerebral disease, and when of a very obstinate character should always lead the practitioner to suspect brain-disease, and accordingly direct his attention to that quarter.

H. *Fracture of the base of the skull.*

The consideration of the subject of fracture of the base of the skull now claims our attention; not because the principles which apply to the other injuries to the cranium and its contents are not applicable to such cases, but because such injuries have symptoms and results which are somewhat peculiar to themselves.

A fracture to the base alone is of no more consequence than a fracture of another part, if it should be unassociated with any injury to the brain itself; but as the base of the brain is the most delicate, and any injury to it is sure to be followed by severe, if not fatal, symptoms, the subject of fracture of the bones upon which it rests becomes proportionably of interest.

A fracture of the base of the skull may be associated with all the intracranial injuries which have been illustrated in the previous pages; it may be complicated with simple concussion of the brain, or with the severer form associated with laceration of the brain-structure, or extravasation of blood upon or within the brain itself. If blood is effused there may be compression of the brain and death, and the same end may be produced by a secondary inflammation of the membranes and injured parts.

Upon the whole, it is difficult to separate the two classes of cases, as the dangers arising from injuries to the skull do not depend upon the seat of fracture, but upon the injuries to the cranial contents; and as the same injuries may be produced, or rather may be associated, with fractures of the base, the complications and dangers are the same in each.

Having, then, so far stated that the dangers of all forms of fracture of the skull are really alike, and that the same intracranial complications attend fractures of the vault as of the base, I will now proceed to illustrate the special symptoms

which are generally regarded as being diagnostic of such injuries, by the brief analysis of cases from my note-book.

Amongst thirty examples which my note-book produces there are twelve cases associated with simple concussion, and in all recovery took place. In three cases the fracture extended through the orbit, as indicated by subconjunctival ecchymosis. In eight examples there was hæmorrhage from the ears; in all this was followed by a discharge of serum, and in seven cases associated with paralysis of the facial nerve upon the same side. In these cases it is quite fair to conclude that the line of fracture extended through the petrous portion of the temporal bone. In two instances there was bleeding from the nose. In one case there was a serous discharge from the ear, accompanied with paralysis of the facial, and in one following hæmorrhage from the ear, but unaccompanied with paralysis.

To test the value of these different symptoms, as indicating fracture of the base, in various positions, the following analysis of the fatal cases will prove of value; and, taking the symptoms separately, subconjunctival hæmorrhage will first claim our attention, as being a symptom tolerably accurately marking a fracture through the orbital plate. In the eighteen fatal examples this symptom was manifested in four instances; in one and all the line of fracture extended through the orbit.

In two cases there was copious hæmorrhage from the ear; in both these the fracture passed through the petrous bone.

In three examples there was some epistaxis; in one of these the fracture extended across the ethmoid bone; in one the frontal sinuses were full of blood and fractured; and in the third the tympanum was found full of blood and the membrana tympani perfect, and upon careful examination the lateral sinus of the brain was found to have been lacerated.

Seven of the eighteen fatal cases died from direct injury to the brain, the post-mortem examination in all revealing severe contusion or laceration of the brain-structure, with effusion of blood upon the surface of the brain or upon the membranes.

Another seven cases died from arachnitis as a result of the injury, in four of these there being contused brain, and in one ecchymosis of the ventricles; in two cases there was no evidence of contused brain, nor was there any effusion of blood; in one interesting case the inflammation spread from the internal ear.

In three the cerebral mischief was complicated with some thoracic or abdominal injury, which caused death ; and in one instance hæmorrhage was the immediate cause of death.

With this brief analysis of the cases I will quote a few of the most interesting examples.

CASE XXXVI.—FRACTURED BASE ; SPINE DRIVEN INTO THE CRANIUM ; BRAIN EXTENSIVELY BRUISED AND LACERATED.

A labouring man, æt. 36, in falling off a scaffolding, pitched upon his head ; he was taken up perfectly unconscious, and brought to this hospital, where he died a few seconds after admission.

Upon examining the body after death, it was clear that the weight of the body, as conveyed through the spine, had completely driven the spinal column into the skull, the base, for about one inch round the foramen magnum, being detached and pressed inwards upon the brain ; this was much lacerated and contused from the pressure of the displaced bone ; fissures radiated upwards from this spot.

This is a most marked instance of fracture from so-called *contre-coup*, and is given here as illustrating the only method by which such an accident could take place ; the vertex, upon which the man alighted, was uninjured, but the whole force was concentrated on the body, and conveyed through the spinal column to the skull ; it is in reality, however, a direct application of the force and not a result of *contre-coup*, which consequently can never produce a fracture.

It is hardly necessary to quote cases illustrating contusion or laceration of the brain from *contre-coup*. This is the most frequent cause of injury to the brain, with or without extravasation of blood upon the surface.

In no less than fourteen instances of the eighteen fatal cases did this complication take place, and in those examples where the brain was contused at the seat of fracture the brain at the opposite side of the skull was, as a rule, found in a more injured condition.

When blood is effused upon the surface of the dura mater, there is generally found some effusion within the mem-

branes or some injury to the brain. Amongst the seven instances where this effusion was detected, in five there was also effusion of blood within and upon the surface of the brain. In the other two cases arachnitis was the cause of death.

CASE XXXVII.—FRACTURED BASE, ASSOCIATED WITH COPIOUS HÆMORRHAGE FROM THE NOSE, NONE FROM THE EAR; LACERATION OF BRAIN BY CONTRE-COUP; SEVERE FRACTURE OF BASE; LACERATION OF LATERAL SINUS; COPIOUS HÆMORRHAGE FROM NOSE AND MOUTH; MEMBRANA TYMPANI ENTIRE.

A man, æt. 52, fell from a height of thirty feet upon his skull; he was rendered completely unconscious, and when admitted into the hospital was in a dying condition, blood flowing rapidly from his nose. He died two hours after the accident.

Autopsy.—Beneath the scalp much blood was effused; upon the *left* side of the skull there was an extensive fracture. The petrous portion of the temporal bone was completely separated from the mastoid, and squamous; the fracture in front extending partly into the sphenoid in the middle fossa, and posteriorly passing across the groove for the lateral sinus where formed by the parietal and mastoid bones; it then extended across the parietal, crossed the sagittal suture at its centre, and nearly reached the frontal bone. There was considerable effusion of blood into the pia mater, especially upon the *left* side and at the cerebellum; the velum interpositum was filled with blood. In the posterior lobe of the left cerebrum there was a laceration, three inches in length, extending through the gray matter (by *contre-coup*). A small laceration was observed also near the vertex. The right lateral sinus was also torn. The right tympanum was full of blood, but the membrana tympani was entire. The stomach was full of blood, which had been swallowed. Other viscera were healthy.

This case is a good illustration of fracture of the base and injury to the brain from a severe shake, as produced by a fall from a height upon the head. The fracture radiated from the seat of injury, and caused absolute separation of the left petrous bone; the left cerebrum was severely lacerated by

contre-coup, and blood extensively extravasated into the pia mater. The one marked symptom of severe epistaxis is interesting, connected with the absence of hæmorrhage from the ear, and the perfect condition of the *membrana tympani*, the blood having probably found its way from the tympanum through the Eustachian tube, thus causing severe epistaxis, and filling also the stomach with effused blood.

CASE XXXVIII.—FRACTURED BASE; SEVERE HÆMORRHAGE FROM THE RIGHT EAR, AND SUBCONJUNCTIVAL ECCHYMOsis; LACERATION OF CAROTID ARTERY AND LATERAL SINUS; LUNGS FILLED WITH BLOOD; DEATH FROM HÆMORRHAGE.

A man, *æt.* 30, when at work, ropemaking, had his head jammed between two cog-wheels; he was rendered perfectly unconscious, and was admitted in this condition, bleeding copiously from the right ear, with subconjunctival ecchymosis, and in a dying condition. He lived two hours only after the accident.

After death there were no external signs of injury; upon removing the scalp the calvaria presented a marked disposition for the bones to separate at the coronal suture. The base of the skull was fissured in all directions, a fracture extending across the ethmoid and orbital plates and basilar process. The left carotid artery had been lacerated in the temporal bone, and the left lateral sinus was also opened; the *membrana tympani* upon the left side was also ruptured. The brain was uninjured, and there was no effusion of blood between the membranes. The lungs were filled with blood, and also the bronchial tubes, the air-cells being full.

There was no doubt, in this case, that death had resulted directly from hæmorrhage, the source being the ruptured carotid artery; the bleeding from the ear was very profuse, and it is very probable also that blood passed down the Eustachian tube, and thus passed into the lungs, the nervous system having been so paralysed as to lose its power, and thus allowing the glottis to remain patent.

In this case there was no injury to the brain, the accident

ance, followed by paralysis of the tongue and strabismus, indicating some mischief to the roots of the nerves at the base. Other symptoms of effusion set in, followed by coma and death upon the ninth day.

The autopsy revealed the true source of all the mischief. There could be little doubt that the arachnitis had spread from the internal ear along the nerves to the general arachnoid, and, involving the nerves of the base, had produced strabismus, paralysis of the tongue and face, coma, and death.

The fact that there had been considerable effusion of blood external to the dura mater from rupture of the meningeal artery is worthy of note, not being connected with any paralysis; and although the clot was at least a quarter of an inch in thickness, and the brain consequently compressed to that extent, it maintained its functions, tending to prove what all experience of injuries to the brain indicates, that local mischief, although severe, may produce but very slight, if any, symptoms, but that general injuries, although slight, may be, and generally are, followed by the worst symptoms.

Having now carefully considered the whole subject of concussion and injuries to the brain, including compression and the extravasation of blood, associated or not with fracture of the skull, the following inferences may, I believe, be fairly drawn:

1. That injuries to the skull are of importance only in as far as they involve the cranial contents; that the local mischief is of small importance compared with the intracranial; and that uncomplicated fracture of the cranium is seldom followed by any injurious symptoms compared with any general injury to the cerebral structure.

2. That a *slight* concussion of the brain, whether associated with a fracture of the vault or base of the skull or not, will generally do well, and will be known by only a slight or temporary suspension of the cerebral functions, independent of the symptoms of local injury.

3. That a *severe* concussion of the brain, whether associated or not with fracture of the vault or base of the skull, is liable to produce primarily contusion or laceration of the brain-structure, either upon its surface or within its ventricles; that

extravasation of blood may also take place, either upon the brain or within its structure; and that, consequently, if the *primary* effects of the accident do not cause a fatal termination, a *secondary* encephalic inflammation probably will.

4. That *contre-coup*, the result of a severe shaking or concussion of the brain, produces severe contusion and laceration of the brain, and with such, extravasation of blood; but that *contre-coup* never yet produced fracture of the skull, and it is doubtful whether it ever produced a rupture of the middle meningeal artery, and, as a consequence, extravasation of blood upon the dura mater and compression of the brain.

5. That a *fall upon the vertex from a height, or a blow upon the head from a blunt instrument*, may be followed by fracture of the skull, or otherwise; but such an accident produces, as a rule, a general concussion of the brain, and with this may be associated any of its complications, such as contusion or laceration of the brain, either upon its surface or within the ventricles, and consequently with effusion of blood.

6. That *falls upon a pointed object, and blows with a sharp instrument*, as a rule, are followed by a local fracture; and that if the brain is injured, it is at the seat of injury. As a consequence, the symptoms may be accounted for by local causes only, and the primary treatment to be adopted must be directed by local considerations.

7. That when symptoms of *compression of the brain* immediately follow an injury to the skull produced by a *fall from a height, or a blow from a heavy and blunt instrument*, the cerebral injury, as a rule, will be general, and the brain will subsequently be found contused and lacerated, particularly at the base, by *contre-coup*; and that if extravasated blood should be found external to the dura mater, blood will also be found upon the surface of the brain, or within its membranes.

8. That if symptoms of *compression of the brain* follow a *local injury produced by a fall upon a sharp object, or a quick blow from a pointed one*, that such symptoms, as a rule, are produced by *local causes*, such as depressed bone, or extravasation of blood from rupture of the middle meningeal artery.

9. That such *local injuries*, when giving rise to general symptoms, should be treated by elevation of the bone, if depressed; but if no general symptoms are present, unless

the bone is comminuted and can be easily removed, no operation is indicated; a local pressure of the brain alone, when uncomplicated with symptoms, generally doing well.

10. That when *compression of the brain* follows as a secondary result of a *local injury* over the course of the meningeal artery, that is, after an interval of time, when reaction has been established, although no depressed bone may be present, it is probably produced by a rupture of one of the arterial branches; the operation of trephining may then be performed with a chance of success, although it is rare to find a very local extravasation, the blood generally passing downwards towards the base, where the operator cannot reach.

11. That when *compression of the brain* follows, as a secondary result, a *general injury*—although that compression is evidently produced by extravasation of blood—the operation of trephining is useless, if not injurious; for although blood may be effused from rupture of a meningeal artery, there will certainly be found some contusion or laceration of the brain itself, or extravasation within its membranes, which the operation cannot relieve, but is sure to increase.

12. That *encephalic inflammation* may follow any concussion or injury to the brain, however slight, whether complicated with fracture or otherwise; and that the danger of such a result is in proportion to the encephalic injury. In cases of contusion or laceration of the brain, with extravasation of blood, it is almost sure to follow, and, as a rule, it will produce a fatal termination. This inflammation may appear within a few hours of the accident, or it may be postponed for some days; it may be very rapid in its course, or very insidious in its nature. If the brain itself is the seat of the disease, it is generally insidious, and either a diffused or local abscess will subsequently be detected; but if the membranes are involved, effusion, coma, and death will rapidly take place.

13. That the *operation of trephining* is perfectly useless in cases of severe concussion of the brain, whether associated or not with fracture, although it may relieve compression of the brain from local conditions; for the brain is generally injured by *contre-coup* at its base, or in positions where no operation can be of benefit, but must prove injurious.

14. That the *operation of trephining* may prove of value

in *local injuries* to the skull or brain, when associated with symptoms of compression and depression of bone, or from the local extravasation of blood. In the former case, when the brain and membranes are uninjured, success may fairly be anticipated; but in the latter, the chances are decidedly against it, as blood, if effused, is seldom local, but passes downwards towards the base.

15. That fractures of the *base of the skull* may take place alone, and be marked by only special symptoms; that they may be associated with, and are generally found in, all severe fractures of the vault, when produced by a heavy fall or blow, the fissures radiating downwards in a direction parallel to the forces employed.

16. That *fractures of the base* may be complicated with encephalic injuries similar to the fractures of the vault, and may consequently be manifested by general symptoms as well as special ones, in severe cases the former completely masking the latter; the injury, however, may generally be diagnosed, the mode of injury indicating the probability of its occurrence.

CHAPTER III.

INJURIES TO THE SPINE.

The close analogy which exists between the brain and spinal marrow, anatomically and physiologically, is completely carried out in their pathology; and the consideration of the results of injuries to the latter is much simplified when the former is well understood. In former pages the results of injuries to the skull and its contents have been carefully illustrated by cases, together with the chief complications, and the symptoms indicating the various pathological conditions which are found in practice. It has been shown that the functions of the brain may for a time be interfered with or suspended by a simple shake or concussion of its substance; that a severe concussion may be found associated with contusion of the brain and extravasation of blood, either upon its surface or within its structure; that fractures of the skull are of importance in proportion to

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the amount of encephalic complications ; and that inflammation of the nervous structure itself, or of its membranes, is too frequently the result of any such injuries, however slight.

When we approach the consideration of the injuries to the spine and its contents, precisely similar results can be deduced. It can be shown that the functions of the cord may be interfered with or paralysed by a simple concussion, and that in severe instances capillary ecchymosis of the nervous structure, or extravasation of blood within the membranes, may also be produced.

Examples may be quoted illustrating the complete or partial disorganization of the cord from the displacement of a fractured or dislocated vertebra, and also others showing the results of inflammatory action following upon any injury.

The secondary results also of injury to the spine, as shown by complete paralysis of all its functions, from a chronic inflammatory change in the tissues of the cord, could also freely be illustrated ; but as these secondary cases come more under the notice of the physician, they will claim only this passing notice.

Space will hardly allow me to quote many examples of each complication, nor is it necessary to do so ; the thoughtful practitioner will soon understand how such injuries are produced, and by what symptoms they will be manifested ; the consideration of the functions and position of the cord will indicate to him the result of any injury to its structure, and will point out the symptom by which such injuries can be diagnosed. A simple concussion of the spine may produce a partial or complete suspension of the cord's functions ; by rest and quiet these symptoms may disappear, and a perfect recovery take place. A more severe concussion may be associated with some injury to the nervous structure, or some extravasation of blood upon or within the cord itself ; such a complication will necessarily be associated with more marked symptoms, and partial or complete paralysis and anæsthesia will be present, varying according to the extent of the mischief and the seat of the injury.

When the spine is fractured or dislocated, like complications may be produced—the cord may receive a simple concussion, or a more serious form of injury may be the result.

The cord may be completely pulped by pressure, or injured to any extent from even a slight bruise, and the symptoms

indicating such a mischief will vary from a partial to a complete destruction of its functions.

Following any one of these injuries, an inflammation of the cord or of its coverings may be excited, and with it the peculiar symptoms and results of such an action.

My notes yield me twenty-five good examples of simple concussion of the spinal cord, either of the cervical, dorsal, or lumbar region, produced by a fall upon the back in either of the above regions. The symptoms produced varied to a great extent; more or less paralysis of that portion of the body supplied by nerves emanating from the injured centre was the chief symptom, and anæsthesia, or loss of sensation, was present in almost all the instances. Retention of urine, also, was a common complication. In sixteen of these instances by simple rest these symptoms gradually disappeared, and a perfect recovery ensued.

In three cases the paralysis, &c., was complicated with severe local pain over the seat of injury, and by the application of a cupping-glass and local bleeding this was relieved, followed by convalescence.

In one case recovery was very slow, and convalescence was hastened by the man being electrified over the spine.

In another example pain in the partially paralysed limbs followed the injury, indicating some excess of action in the centre; and some slight mercurial, in the form of the Hyd. c. Cret. c. Pulv. Dov., ana gr. iij, was given twice a day with marked benefit, pain disappearing and a cure taking place. In one case the paralysis and loss of sensation of the whole body below the neck was perfect, and the concussion was so severe as to completely paralyse the spinal centres, allowing an involuntary discharge and constant flow of urine; this lasted for about twelve hours, when power of the limbs gradually returned, followed by steady convalescence.

It is thus seen that in the simplest form of concussion of the spine there is but slight paralysis and loss of sensation of that portion of the body supplied with nerves from the injured centres. That in more severe cases there is some retention of urine, arising from the loss of voluntary power over the muscles which regulate micturition. That in still more perfect examples of concussion the paralysis and anæsthesia of the body

may be perfect, and associated with absolute paralysis of the bladder and all its muscles, allowing the flow of urine from its cavity as secreted. (This condition of the bladder must not be confused with the involuntary discharge of urine from an over-distended viscus, which may be seen in the former and simpler class of cases.)

In all cases such as these, if a subsequent inflammatory condition does not take place, a perfect recovery may ensue, as all these symptoms may be produced without any permanent change or injury to the nervous structure.

The treatment most beneficial is that which succeeded in the examples already quoted, perfect repose in the horizontal position being absolutely essential.

In instances where severe local pain is present, the application of a cupping-glass, with or without the extraction of blood, will be found of benefit. When there are symptoms of excess of reaction, some mild mercurial, such as the gray powder or the bichloride, should be employed, and the local application of a blister is often advantageous. In those cases where recovery is very slow, unattended with any symptoms of inflammatory action, electricity applied to the spine and muscles involved should also be advised, and under these simple means recovery may generally be expected.

CHAPTER IV.

FRACTURES AND DISLOCATIONS OF THE SPINE.

The spinal cord, like the brain, is so carefully protected from injury by its osseous covering, and any slight injury to its delicate structure is so sure to be followed by severe symptoms, that it can be no subject of surprise that fractures and dislocations of the spine are injuries of a very grave nature, and that it is rare for such accidents to take place without the cord itself being more or less involved. The clinical experience of Guy's Hospital for the last five years fully bears out this idea; for out of twenty-four examples of fracture and dislocation of the spine, three only have escaped with their lives; and the functions of the cord in these instances had not perfectly been restored.

I have classed fractures and dislocations of the spine together, as these accidents are frequently combined. It has been generally taught that the latter form of accident is exceedingly rare, but my own experience leads me to believe such an opinion to be erroneous; for amongst the twenty-four cases which my notes yield me, including all the examples of such an injury to the spine admitted into Guy's during the last five years, six are cases of pure dislocation of the spine, three of fracture, and eight of fracture and dislocation combined; and the fact in these seventeen examples was verified by a post-mortem examination. In the remaining seven cases a fracture was diagnosed, but not proved.

Of these seventeen cases of fracture and dislocation of the spine, in which a post-mortem examination was made, in ten the seat of injury was in the cervical region, in seven in the dorsal.

Amongst the injuries to the cervical region—

Five were pure dislocations, two between the fourth and fifth cervical, two between the fifth and sixth, and one between the seventh cervical and first dorsal.

Five were dislocations and fractures combined; in each the body was dislocated forwards from the one below, the articular processes were separated at their joints, and in each there was a fracture through the spinous processes or laminæ of the dislocated vertebræ, the dislocation taking place at the lower surface of the third, fourth, fifth, sixth, and seventh vertebræ respectively.

Amongst the injuries to the dorsal region—

One only was a pure dislocation, taking place between the eleventh and twelfth vertebræ; the ligaments confining all the joints were ruptured, and the body of the eleventh thrown forwards.

In three the eleventh dorsal vertebra was dislocated forwards from the twelfth, tearing through the intervertebral substances, and associated with fracture of some portion of the arches of the lower vertebræ; the articular surfaces, however, in all instances, being singly or doubly dislocated.

In the three remaining instances a fracture alone existed.

In one the fourth and fifth were comminuted ; in one the eighth, ninth, and tenth were fractured through the bodies and laminæ ; and in the third the twelfth dorsal with the three first lumbar were extensively fractured.

In the remaining seven cases all were in the dorsal region, and about the tenth, eleventh, and twelfth vertebræ ; and three of these recovered.

From the preceding analysis it would appear—

1. That injuries to the spinal column are more frequent in the dorsal than in the cervical region, but only in the proportion of 58 to 41.

2. That in injuries to the cervical region simple dislocation of the spine is as frequent as the combination of dislocation with fracture. That in all such injuries the intervertebral substance is torn through, the upper vertebra being, as a rule, thrown forwards ; and that where fracture takes place it is generally at the spinous process, and not in the bodies.

3. That such dislocation may take place between any of the bodies of the cervical vertebræ ; that between the fourth, fifth, and sixth being the most common.

4. That in injuries to the dorsal region pure dislocation is very rare, although it may occur ; that such injuries generally take place between the tenth, eleventh, and twelfth vertebræ ; that the body of the superior is generally dislocated forwards, and the body of the inferior is as generally fractured ; and that some portion of the arch of the inferior vertebra is, as a rule, broken.

Having carefully considered the condition of the spinal column after injury, and the form of accident which is most likely to occur, we will now proceed to the consideration of the condition of the cord itself, and we shall find that such accidents are generally complicated with very serious and destructive changes within its structure.

Amongst the twenty-four examples there were nineteen in which there was most perfect paralysis below the seat of injury immediately after the accident ; in eighteen of these there was also perfect anæsthesia, and in one hyperæsthesia.

In two cases there was no paralysis at the time of injury, but when reaction set in paralysis appeared.

In one case there was no paralysis or injury to the cord.

In two the paralysis was but partial, and both recovered.

The condition of the cord in seventeen cases in which a post-mortem examination was made revealed the fact—

That in one case the cord was completely divided at the seat of injury, the ends being one inch apart.

That in eight instances the cord was completely crushed, and in all these perfect paralysis had been present below the seat of injury.

That in four cases the cord was bruised, blood being extravasated within its structure. In all these cases there was paralysis, and in all the injury was in the cervical region. In one of these hyperæsthesia existed.

In two cases the cord was found uninjured, but in one of these there was secondary paralysis from the effusion of blood external to and within the membranes.

In two instances the cord was found softened from inflammatory action, the patients surviving the injury ten and sixteen days. In both of these cases there was secondary paralysis—in one after the period of reaction had taken place, and in this blood was effused within the membranes compressing the cord; in the second there was also effusion of blood external to the membranes.

In three cases only was blood found effused within the membranes; in two of these the cord was sound, and in both secondary paralysis took place; in one there was paralysis after the injury, and blood was found effused within the cord itself.

In two instances only was blood found external to the dura mater; in one of these secondary paralysis existed upon the fourth day, and the cord was found softened from inflammatory action, and in the other it was associated with hæmorrhage within the membrane and compression of the cord.

It appears, then, in addition to the conclusions given in the last page—

5. That a fracture or dislocation of the spine may take place and the cord remain uninjured ; that such an escape is quite exceptional, and that, as a rule, the cord is seriously involved.

6. That in at least seventy-five per cent. of all cases of fracture or dislocation of the spine the cord is irreparably injured and disorganized, either by the primary mechanical pressure of the dislocated bone, or by the effusion of blood within its structure.

7. That in the remaining twenty-five per cent. the injury may be partially or wholly recovered from, there being no disorganization of the cord ; temporary, perfect, or partial paralysis may be present, and unless some secondary inflammation take place, a recovery may follow ; in these cases it is fair to believe that the cause of the paralysis is merely some extravasation of blood external to the cord.

Having thus far dwelt upon the pathology of this interesting class of injuries, it may not prove without advantage to consider briefly the duration of life and some of the symptoms and causes of death ; and reviewing the ten examples of injury to the cervical region, it appears that in two only was life prolonged beyond forty-eight hours after the accident ; in one of dislocation between the fourth and fifth vertebræ, with disorganization of the cord, the patient survived but thirteen hours ; five lived only thirty-six, and two forty-eight hours. In all these the disorganization of the cord had taken place opposite the fifth or sixth vertebra.

In two examples the injury to the spine and cord corresponded to the seventh cervical ; one of these lived seventy-two hours, and the second seven days.

In all of the eight first cases the respiration from the commencement was diaphragmatic ; but in the two last, at the commencement, it was not so entirely, but in one became so at the end of forty-eight hours, and the patient died twenty-four hours subsequently. In the second it became so upon the fourth day, and upon the seventh the man died.

Amongst the eleven fatal cases of fracture and dislocation of the dorsal vertebræ, eight died within eighteen days, the

most rapid death taking place at the tenth, at which period three died.

The remaining patients survived the accident 90, 134, and 232 days respectively.

8. It is fair, then, to conclude, that in injuries to the cervical spine death takes place more rapidly the higher the mischief to the cord exists, and that death generally takes place within forty-eight hours; and that when the injury is lower down, that is, below the seventh vertebra, the patient will not survive more than three days, when the respiration is also carried on through the diaphragm.

9. That in injuries to the cord in the dorsal region, if the patients survive beyond the seventeenth or eighteenth day, they may live for weeks; and that a gradual sinking, and the complication of a bed-sore, is too frequently the immediate cause of death.

I shall now proceed to quote some few examples of injury to the cord as the result of violence, selecting my cases only as they illustrate any complications of the cord itself, quite irrespective of the accident to the spinal column.

CASE XL. — FRACTURE AND DISLOCATION OF THE SPINE IN CERVICAL REGION; NO DISPLACEMENT; CONCUSSION OF CORD; PARALYSIS OF THE LEGS, LEFT ARM, AND SPHINCTERS, WITH ANÆSTHESIA AFTER THE ACCIDENT, FOLLOWED BY HYPERÆSTHESIA; ECCHYMOSES INTO THE POSTERIOR HORN OF GRAY MATTER ON LEFT SIDE, ALSO INTO ANTERIOR HORN ON RIGHT SIDE AND INTO THE POSTERIOR COLUMNS; DEATH THIRTY-FOUR HOURS AFTER THE ACCIDENT.

Joseph K—, æt. 33, a coal-porter, when carrying a sack of coals down some stairs, fell, with the sack of coals falling upon him. Admitted immediately after the accident, with paralysis of the legs and left arm, and also of the sphincters; there was also entire loss of sensation in the left arm as high as the deltoid; he could feel about the feet and on the outer side of the thigh, but not upon the anterior and inner surface. The seat of sensation, however, was very variable,

returning to spots where it had just previously been absent ; apparently the most distant parts recovered first. There was slight priapism, and the breathing was diaphragmatic. After a few hours sensation returned in every part. As the skin became warm, he complained of pain when lightly touched. The day following, the sensibility of the surface appeared to be excessive, judging by his exclamations when the skin was touched or pinched. This was especially noticed in the right arm. Priapism, which existed when he was admitted, passed off after two hours, but returned the day following. He continued to have power to move the right arm, and died thirty-four hours after the accident.

Post-mortem examination.—Spine only examined.—There was no external trace of the injury ; the membranes of the cord were healthy. Opposite the fourth and fifth cervical vertebræ the substance of the cord was contused. On section there was found ecchymosis of the posterior horn of gray matter on the left side, and of the adjacent part of the lateral and posterior columns. There were also other limited spots of ecchymosis on the right side, one in the right posterior column, and one in the anterior cornua of the gray substance. The gray matter generally was hyperæmic from venous congestion, but there was no other lesion of it except at the two spots named.

Upon examining the spinal canal, after the removal of the cord, nothing abnormal was discoverable in the bodies of the vertebræ opposite the lesion of the cord ; but in dissecting off the posterior ligament it was seen that the body of the fourth was separated from that of the fifth, and that the left articular process of the fourth had been chipped off by the violent pressure of the lower against it.

The above case I have quoted at some length, as it affords an admirable illustration of extravasation of blood within the cord as the result of violent concussion ; it is true the bones were fractured, but as no displacement had taken place, such a fracture could not have affected the cord.

This case has been already published by Dr. Gull in the ‘Guy’s Hospital Reports’ for 1858, and in his remarks upon it he draws attention to “the limitation of the injury, pro-

ducing paralysis of the left arm whilst the right retained the power of motion; the immediate effects of concussion on the cord, producing anæsthesia for a few hours; the return of sensibility, first, in the parts most distant from the injury; and the development of hyperæsthesia.”

CASE XLI.—FRACTURE AND DISLOCATION OF SPINE BETWEEN FOURTH AND FIFTH CERVICAL; CONCUSSION OF THE CORD; RECOVERY OF POWER AFTER TWO HOURS; SECONDARY PARALYSIS AS A RESULT OF THE EFFUSION OF BLOOD OUTSIDE THE THECA VERTEBRALIS; DIAPHRAGMATIC RESPIRATION; INTENSE HEAT OF SKIN; DEATH IN FORTY-FIVE HOURS.

Robert L—, æt. 40, having fallen backwards, with a heavy plank falling upon him, was admitted into Guy's, collapsed but sensible; there was perfect paralysis of the left leg, partial of the right, and of both arms. After two hours he was able to flex his legs and grasp the hand, the skin also became warmer. No injury to the spine could be discovered. After six hours he said he was quite comfortable; he passed a restless night, and the following morning, sixteen hours after the injury, he was found perfectly paraplegic, both in the upper and lower extremities, with loss of sensation, and priapism. The ribs scarcely moved in respiration; the temperature of the skin increased; abdomen tense and tympanitic. During the day the skin became intensely hot, and the breathing wholly diaphragmatic, and he died forty-five hours after the accident.

At the post-mortem examination there was no external evidence of injury to the spine. Upon dividing the soft parts there was found a separation between the fourth and fifth cervical spinous processes, and dislocation of the articular processes. The interspinous and capsular ligaments were torn through. There was extravasation of blood outside the theca vertebralis on its anterior aspect, the effused blood compressing the cord, which was otherwise uninjured, for after careful examination there were not found any signs of bruising of its tissue. The extravasation apparently arose from injury to the lower part of the body of the fourth vertebra, which had been fractured, and the intervertebral substance torn. The

calibre of the canal was slightly encroached upon by displacement of the fourth vertebra, but not so as to press upon the cord. The extravasation, though most abundant opposite the injury, extended downwards for some distance; the membranes of the cord were uninjured.

In this instance the symptoms which first followed the injury were only such as might be produced by a concussion of the spine, and the fact that they rapidly disappeared justifies the opinion, for any injury to the centres causes more durable symptoms. With the establishment of reaction appeared paralysis, fairly indicating some compression of the cord; and the subsequent condition revealed extravasation of blood external to the membranes. The paralysis of the muscles of respiration, with the exception of the diaphragm, was the cause of the rapid death, few patients living, as I have previously shown, forty-eight hours when such a condition was in existence.

The two examples already quoted illustrate the fact that extravasation of blood, external to and within the cord, may be produced by a violent concussion. The following case will prove that the same complication may be produced by pressure upon its substance.

CASE XLII.—FRACTURE AND DISLOCATION OF THE CERVICAL SPINE; IMMEDIATE PARALYSIS BELOW THE SEAT OF INJURY; DIAPHRAGMATIC RESPIRATION; DEATH IN THIRTY-SIX HOURS; EXTRAVASATION OF BLOOD WITHIN THE SUBSTANCE OF THE CORD.

J. W—, æt. 38, a sawyer, was admitted into Guy's, under the care of Mr. Birkett, with perfect paralysis of body and legs, and partial of the arms; there was paralysis also of the intercostals, and retention of urine. The respiration was entirely diaphragmatic, the man, just prior to his admission, having been swung into the air by an acquaintance and fallen upon his neck. The respiration became more difficult, and he died eighty hours after the accident.

After death the fifth cervical vertebra was found dislocated forwards from the sixth for about half an inch, tearing with

it a thin section of bone from the latter; the articular surfaces were dislocated and the arch fractured. The membranes of the cord were uninjured, and no blood was effused external to the cord; this was indented and softened at the seat of injury, and a section showed it to be of a dark red colour from effused blood within its substance. The lungs were gorged with blood and apoplectic; there was also effused blood along the spine, this blood probably coming from the apex of the left lung, which was injured.

CASE XLIII.—DISLOCATION OF SPINE IN CERVICAL REGION BETWEEN SIXTH AND SEVENTH VERTEBRÆ; PARALYSIS OF BODY BELOW THE SEAT OF INJURY; DIAPHRAGMATIC RESPIRATION; DEATH IN THIRTY-SIX HOURS; CRUSHED CORD.

W. S—, æt. 36, when drunk, fell down stairs upon his neck, bending his head forwards. He was taken up paralysed, and admitted into Guy's under the care of Mr. Hilton. There was complete paralysis of the body and legs, and partial of the arms. No excito-motory action could be exerted. The respiration was purely diaphragmatic, and he died thirty-six hours after the accident.

Upon subsequent examination no external signs of injury were present. Upon removing the soft parts about the spine, a gap was seen between the fifth and sixth spinous cervical processes, the ligaments were ruptured, and articular surfaces completely dislocated, allowing the finger to be passed inwards upon the cord; the fifth vertebra was torn from the sixth, through the intervertebral substance; there was no fracture, and the anterior ligament of the spine was not ruptured. The medulla was crushed, and of a red colour from the extravasation of blood within its structure.

CASE XLIV.—DISLOCATION OF THE FOURTH CERVICAL VERTEBRA FORWARDS FROM THE FIFTH; PARALYSIS; DIAPHRAGMATIC RESPIRATION; DEATH IN THIRTEEN HOURS.

G. W. D—, æt. 17, having when wrestling been thrown with his head under the arm of his adversary, was admitted under the care of Mr. Birkett, some hours after, completely paralysed

below the neck, and quite sensible. The respiration was carried on solely by the diaphragm, and he died in thirteen hours.

The muscles of the neck were infiltrated with blood, and the finger could be easily introduced between the spinous processes of the fourth and fifth cervical vertebræ. The fourth was found to be completely dislocated forwards from the fifth, tearing through all the ligaments and the intervertebral substance. The sheath of the cord was sound, but on opening it the medulla was found to be a mere red diffused mass from effused blood. The lungs were intensely congested, and in parts blood was effused into the tissue; the tubes also contained blood. The other viscera were healthy.

The two cases just quoted are fair illustrations of pure dislocation of the cervical spine with destruction of the cord, causing complete paralysis of the whole body below the seat of injury. The immediate cause of death in both was tolerably clear—the want of aëration of the blood, the act of respiration being carried on exclusively through the diaphragm. The post-mortem condition of the lungs in the latter case is one worthy of notice, blood actually being effused into the tubes as well as into the air-cells. This condition of the lungs is such as is usually found in such cases, the patient in these instances dying asphyxiated.

CASE XLV.—DISLOCATION OF THE ELEVENTH DORSAL VERTEBRA, WITH FRACTURE OF THE TWELFTH; ANÆSTHESIA OF THE SCIATIC NERVES, BUT NO PARALYSIS; AFTER A FEW HOURS RETURN OF SENSATION, BUT PARALYSIS OF BOTH LEGS, AND PAIN IN COURSE OF THE ANTERIOR CRURAL; DEATH UPON THE TENTH DAY; BLOOD EFFUSED ROUND THE CORD, AND WITHIN THE GRAY MATTER.

W. O—, æt. 33, a labourer, when at work was prostrated by a weight of timber falling upon his shoulders, doubling him up. He was admitted shortly afterwards with complete loss of sensation in the course of the sciatic nerves, but no paralysis. There was severe pain across his loins, and retention of urine. Upon examining the spine some displacement of the eleventh dorsal vertebra was very evident. In a few hours sensation returned,

but both legs became paralysed. The day following, the man complained of severe pain in the course of the anterior crural nerves. In another twenty-four hours all pain ceased, and complete paraplegia and anæsthesia existed, and upon the tenth day he died.

At the post-mortem examination the eleventh dorsal vertebra was found dislocated forwards, tearing through all the ligaments and the intervertebral substance, the extreme edge of the body of the twelfth only being fractured.

Blood was extensively effused round the cord at the seat of injury, the membranes were natural, and the surface of the cord was flattened and felt soft. A section showed a pulpy condition of its structure for some distance above and below the injury; the gray matter could not be distinguished, being mixed with blood and disorganized. This condition extended downwards to the extremity of the cord, and as high as the fourth or fifth dorsal vertebra.

In this case it would appear that the cord could have received but a slight injury at the time of the accident, as the only symptom was anæsthesia in the course of the sciatic nerves, but no paralysis. At the expiration of a few hours paralysis of both legs came on, and it is fair to conclude that at this time some secondary hæmorrhage took place at the seat of injury, and probably that hæmorrhage was external to the cord. At a subsequent stage perfect paralysis of the whole lower portion of the body appeared; and the post-mortem condition of the cord revealing a distinct effusion of blood into its gray matter, causing disorganization of its structure, clearly indicated the cause.

Enough examples have been quoted to illustrate the injuries to the cord which are liable to occur in cases of fracture or dislocation of the spine, and I shall now quote one instance of fracture of the spine, unattended with any injury to the cord whatever or any spinal symptoms.

CASE XLVI.—A woman, æt. 49, in a fit of mania jumped out of window. She was subsequently admitted into the hospital with a severe contusion of the back and head, but no other signs of injury; she was able to walk and move her limbs in every direction, but was evidently maniacal; there was no retention

of urine or any single symptom of injury to the nervous centres. After a few days, when the maniacal symptoms had been subdued, she remained in bed, and became perfectly quiet. She lay still with her eyes closed for many days, but would occasionally rouse herself, and speak rationally. There was no paralysis, and she sunk upon the sixteenth day.

Post-mortem—by Dr. Wilks :

The calvaria was rather heavier than normal, and there was considerable subarachnoid effusion over the whole brain, lying in small pools over certain sulci. The convolutions were much wasted ; the ventricles were dilated with serum ; the surrounding parts wasted, and the septum was like a piece of tissue-paper, and diaphanous. The brain weighed only two pounds seven ounces.

Spine.—The last dorsal and three upper lumbar vertebræ were fractured, a fissure extending through all their bodies ; but there was no displacement. The spinous processes and arches of two of the vertebræ were fractured, and blood was effused into the soft parts around, but the cord and membranes were uninjured.

The viscera generally were fatty.

This case has been given simply to illustrate the fact that severe fracture of the spine may take place, and yet no injury to the cord itself occur ; it is interesting also to observe that the patient walked about freely, and yet never gave any symptoms of fracture. The wasted condition of the brain, associated with mania, is worthy of notice.

There would be no difficulty in giving the details of many cases of inflammation of the cord and of its membranes after injury ; such a complication may take place from the simplest blow, concussion, or any severer accident ; but it will be foreign to my purpose to enter more fully into this subject, and I can refer the reader interested in such matters to a series of papers published by Dr. Gull, in the last volumes of the ‘Guy’s Hospital Reports.’

CHAPTER V.

In an early page there are tabulated 82 cases of disease of the spine ; in 16 this disease was in the cervical, and in 66 in the dorsal or lumbar region ; in the majority it appeared to be situated in the lower part of the dorsal. In one of the cervical it was complicated with abscess, and in 47 of the remainder—

In 25 examples it opened in the course of the psoas muscle ; in 9 in the right groin, and in 16 in the left.

In 20 examples the abscess was a lumbar one, and appeared about equally on both sides.

In 2 it was gluteal.

Six of these cases subsequently died, worn out by the discharge.

There are also tabulated 17 cases of spinal paralysis ; in some instances the paralysis followed injury, in others no real history could be obtained.

It is not my intention to dwell longer upon this subject. In the treatment of all the spinal cases absolute rest was essentially observed ; where signs of inflammatory action were present, mercurials, in the form of the bichloride, were given with tonics ; and where no such symptoms were manifested, tonics alone were given. The spinal abscesses were seldom opened, and only when pain was great. I have classed all the psoas, lumbar, and gluteal abscesses under the one heading of spinal abscess, as such a term better illustrates the pathology of such affections ; and to those readers who are anxious for more information upon these subjects, I must refer them to the standard works upon the subject.

ON THE
SURGICAL DISEASES AND INJURIES
OF THE
NOSE, LARYNX, THORAX WITH ITS CONTENTS,
AND OF THE
ORGANS OF CIRCULATION.

CHAPTER VI.

SURGICAL DISEASES OF THE NOSE.

CONSIDERING for one moment the extent of the respiratory tract, and the various important parts and organs which combine to form it as a whole; remembering, at the same time, the special functions of the nose and larynx; it can be no subject of surprise that the diseases of the respiratory passages should possess a double interest, both as being the seat of special functions, as well as forming the machinery of the important office of respiration. In the following pages I propose to consider the nose, larynx, and thorax with its contents, especially in their relation to clinical surgery, and it will be my endeavour to illustrate their various morbid conditions, with their appropriate treatment, as they come under the notice of the surgeon.

Commencing with the nasal cavity, the *obstructive diseases* are the most frequent, and it is on their account that the patient

generally applies to the surgeon; in the infant such a condition may be the result of congenital syphilis, which will be indicated by the history and by the concomitant symptoms. The "snuffles" in infancy is very characteristic, and should always direct the practitioner to look out for some specific affection; in isolated cases it may be the only symptom of hereditary syphilis, and by proper treatment it may be cured without any other complication making its appearance; although, as a rule, if looked for, some cutaneous affection will be observed. The mercurial treatment is strongly to be recommended, a grain of gray powder, with three or four of dried soda, twice a day, generally proving quite sufficient to cure the disease.

Foreign body in the nasal cavity.—In older children, suffering from any obstruction to the nasal cavity, the presence of a foreign body should always be suspected; the absence of a history in such instances should never be allowed to mislead the practitioner, as instances are not uncommon where some foreign body has been left in the nasal canal for many months. A child, four years of age, not long since, came under my care, who had suffered from all the miseries of an obstructed nasal passage for eight months, from the presence of a plum-stone. Many remedies had been tried, but without effect, the foreign body being unsuspected; its removal was rapidly followed by convalescence. Ulcerations of the mucous membrane, from the inflammation excited by the foreign body, may tempt the surgeon to overlook the nature of the case; he must therefore remember that such a disease as ulceration of the nose in children, except at the immediate orifice, is by no means common, and that the probabilities of its being excited by a foreign body are very great.

The removal of these bodies, when firmly impacted, requires some care, and the administration of chloroform cannot be too highly recommended, particularly when the child is young and is likely to offer much resistance, which may generally be expected. A firm, hook-bent probe, introduced down the floor of the nose, may be passed with facility behind the foreign body, which may then be extracted with some slight force; in some cases a pair of forceps will suffice; gingerbread and other soft materials should be scooped out, and the nose well syringed. I have never known any good result from syringing this cavity

when any solid body has become impacted, and do not therefore advise such a practice, except for cleanliness and to obtain a good view. Mechanical means always succeed, and are the simplest, particularly when the child is under the influence of chloroform.

In older children and in adult life obstruction to the nasal passage may be produced by many diseases. The presence of a foreign body may be the cause, in which case a true history will generally be given, and thus the surgeon is more likely to arrive at a just conclusion as to the character of the disease.

Polypus nasi is by far the most common. It may be found in one or both nostrils, in the old or young; it may be of a simple gelatinous, fibro-cellular, or fibrous structure, or of a malignant nature. The gelatiniform and the fibro-cellular are by far the most common, and are not difficult to recognise; they, as a rule, spring from the middle turbinated bone and from its posterior portion; they may, however, grow from other parts, but never from the septum.

They are seldom recognised in an early condition, as they cause no pain and but little inconvenience to the patient; a slight excess of discharge is the earliest symptom, and this is generally regarded as being the result of "cold;" but when this secretion is examined, it will be observed to be more serous than is found to exist in an ordinary coryza. The discharge continuing, may at last cause some anxiety to the patient, and if the surgeon be consulted, a careful examination with a speculum should be instituted, when a polypus, or rather a fringe of polypi, will often be observed on the margin of the middle turbinated bone. When the disease has been made out, removal of the growth is the only effectual treatment. Tonics and local astringents may for a time retard their growth, but can never be expected to effect a cure; the application of the powdered sulphate of zinc as a snuff has been much advised, but I cannot quote an example in which I have observed any decided benefit from its use; it gives much pain at times to the patient and causes even ulceration of the mucous membrane, and I am disposed to regard the inconvenience produced by its use as far outweighing its beneficial influence. The use of an astringent, such as tannin, as a lotion, appears to me to be much more efficacious, and it

may be employed of variable strength without causing any inconvenience, about five to ten grains to the ounce being the most useful.

The removal of these softer kinds of polypi should always be by abruption. Some surgeons employ a long pair of well-made forceps, which merely fix the pedicle, and then, by a slight twist and some force, removal is effected. But the best instrument by far is a "noose," as invented, I believe, by Mr. Hilton; it is an instrument which can be easily handled, and is so constructed as to pass a wire over the polypus, and having encircled its base, strangulation and abruption is easily accomplished; its advantage is shown in the facility with which it can be manipulated, and the almost certainty with which the pedicle alone is encircled; ensuring the removal of the growth, without its laceration; and preventing the evils which follow from the flow of blood when caused by a laceration of the polypus itself. By the use of this instrument the nose may generally be completely cleared at one operation; and this great advantage cannot be realised when the forceps alone are employed; for by these the polypus itself is commonly injured, and any further proceedings are interfered with by the hæmorrhage which is sure to follow. Subsequent to the operation the use of an astringent lotion may be strongly recommended, the tannin being my favorite one, about five grains to the ounce.

Examples of nasal polypi of the simpler kind are not often admitted into the hospital. I have notes of but twenty-two cases during the last six years; sixteen being males, and six females. Ten commenced in patients under twenty years of age; five between twenty and thirty; four between thirty and forty; three between forty and sixty; the youngest being eight and the oldest seventy-five years of age, but in the latter the disease had existed for many years.

It would thus appear that in early and adult life it is the most frequent, and that as age progresses the tendency to the development of such growths considerably diminishes.

The *firmer and fibrous forms of polypi* seldom spring from the turbinated bones; the gelatinous and fibro-cellular almost alone monopolising this position. The former are by no means so common, and appear to grow more frequently from the upper and posterior portion of the nasal cavity; they do not make

their appearance so early in life, are far more serious in their nature, and are more difficult, on account of their position, to treat.

Their removal is the only efficient treatment, and this can only be done when the tumour is favorably situated. If it grows forward, the nose may be slit up and the growth removed, either by excision, ligature, or both.

If they press backwards down the pharynx, means adapted to the requirements of the case, calculated to procure a like end, must be employed: the soft palate may require division, but such a practice should not be performed unless absolutely essential. In the following case the difficulties and dangers of the disease are well exemplified, and also the benefit of a sound practice.

CASE.—A boy, *æt.* 15, was admitted into Guy's Hospital under the care of Mr. Cock. For two years he had been the subject of a gradually enlarging polypus of the left nostril, and one year previously had undergone an operation in a metropolitan hospital for its removal; it returned, however, immediately, and grew rapidly, projecting for some extent from the nostril. Some hæmorrhage occasionally took place from it, rendering the boy pale and bloodless.

When admitted, there was a large, malignant-looking tumour, dilating and projecting from the left nostril; it passed backwards also into the pharynx, and pushed forwards the soft palate. The boy was much exhausted from the discharge and from repeated hæmorrhage; none other but local symptoms were present.

A few days after admission severe bleeding took place, inducing Mr. Cock to apply at once, by means of a double canula, a strong ligature around its base; having previously slit up the nostril to give room for manipulation; on the seventh day the strangulated mass came away, and the parts slowly healed. The chloride of zinc paste was subsequently applied to the pharyngeal root of the growth with perfect success, no return having taken place four years subsequently.

About one year after the operation the edges of the nostril

were pared, and brought together; good union resulted, and thus a perfect recovery ensued.

In *malignant polypi* like treatment is required, although equal success cannot necessarily be expected. The difficulty of the prognosis in these cases results always from the difficulty of forming a correct diagnosis, for when these larger growths have ulcerated, the character and fetor of the discharges are always liable to mislead, and thus a simple growth may be mistaken for a malignant one, and *vice versa*.

The treatment, however, in both is somewhat similar. Where excision can be performed, it should be carried out, for by such means great temporary relief is offered to the patient. If otherwise, palliative measures alone can be employed; the discharges should be frequently washed away by means of the syringe, and some slight astringent lotion, such as the lead, alum, or tannin, topically applied to arrest secretion, prevent hæmorrhage, and in a measure retard the growth of the disease.

I have five examples of suspected or proved malignant polypus of the nose. Two passed forwards, and relief was obtained by the excision of the growth. Three passed backwards into the pharynx, in which palliative treatment alone was employed.

There are other conditions of the nasal cavity which are not unfrequently mistaken for polypus; many such have passed under my notice, the patients applying for the removal of the growth when, in reality, none such existed.

The first condition which I shall bring forward is a *malformation of the septum nasi*, the septum projecting either into the right or left nostril, and thus causing more or less obstruction to respiration, leading a superficial observer to believe in the presence of some new growth. The knowledge of the existence of such a condition is quite sufficient to prevent any careful surgeon falling into such an error. One case of a girl, æt. 11, was admitted into Guy's Hospital with such a condition, having been sent far out of the country to have the so-called polypus removed.

The second condition of the nose which may be, and frequently is, mistaken for polypus, is a *chronic inflammation and consequent thickening of its mucous lining*.

The patient complains of difficulty in respiration, and feels that there is something in the nose which mechanically impedes that function. On examining the cavity, a smooth, projecting, and firm outgrowth will be observed on its outer wall, which may be regarded as a polypus, but which is really only the lower turbinated bone covered by a thickened and inflamed mucous membrane.

If a little care be taken in the history of the case, an obstruction to the respiration is the only symptom of any importance; there is no serous discharge, which is to be found so copious in cases of polypi, although there may be a discharge of tenacious mucus; but this is not common. The secreting function of the mucous membrane in these cases is generally diminished, and a great dryness may be present, accompanied with a loss of the sense of smell.

The best treatment in such examples is the constitutional, in the form of tonics, using the one which appears to be most suited to the general wants of the patient's system. Some slight stimulating lotion, such as the sulphate or chloride of zinc, or nitrate of silver, in the strength of two grains to the ounce, may at times be required, but constitutional means alone are generally sufficient. I have one example only from the in-door experience of the hospital of this condition, also sent in as one of polypus, but from my out-door practice many might be quoted. Removal of the turbinated bone for this affection has been advocated and performed by some surgeons, but at present I have not seen any instance where such an operation was required, and should hesitate to adopt the practice, believing that other minor measures will suffice to effect a cure.

It is worthy of observation that this disease is at times confined to the mucous membrane over the lower turbinated bone; the reasons for which fact I am unable to explain.

Ozæna.—We will now proceed to the consideration of another large and important class of cases, which are too frequently treated of under the name of *ozæna*, but which essentially depend upon many different morbid conditions. In all an offensive discharge, or rather smell, is the common symptom, giving rise to the term designating the disease.

I am not aware that it has ever been satisfactorily proved

that this offensive smell is the result of any morbid secretion of the part; my own experience has not furnished me with any information tending to confirm such an idea, and I believe that the fetor is generally, if not always, the result of the decomposition of the retained mucus; at times associated with an ulcer of the mucous membrane; and at others with some diseased bone, the result of syphilis or otherwise. The disease generally progresses very insidiously, and many months have usually elapsed before the surgeon or medical adviser is consulted.

The patient at first believes the symptoms to depend upon an ordinary catarrh; the discharge from the nose is thick, but not offensive, and the sense of smell is more or less impaired. If these symptoms continue, the health of the sufferer generally declines, and being generally found in weakly and delicate people, the physician is consulted for the want of power, the local symptoms assuming a secondary importance.

If the nose be examined, as it should be, with a speculum, to obtain a good view of the whole, the only morbid condition which will be visible is intense congestion of the mucous membrane; it will not be much, if at all, thickened, but will be of a deep colour, evidently the result of engorged vessels. This fact is of some value and interest, as this morbid condition is associated with excess of secretion, but in those cases of thickened mucous membrane which have been previously alluded to there is a marked deficiency. The only correct and satisfactory treatment is the constitutional. Improve the general condition of the body, and the local disease will disappear; to this end consider well the hygienic agents with which the patient is surrounded; if any be deficient, let the deficiencies be supplied; if tonics, as quinine or iron, should be indicated, let them be administered. Attend to the secretions, and remove all external and internal causes which may prove detrimental to health.

The local disease may usually be left alone; it depends upon general conditions, and when these conditions are improved, it may confidently be asserted that the local symptoms will disappear. The inhalation of steam at times will assist the removal of the secretion and relieve the state of fulness of the part which some patients so much complain of.

In other cases the injection of warm water affords relief, especially if the discharges have a tendency to desiccate, adhere to the mucous lining, and, as a consequence, to putrefy; and it is this putrefaction of the retained muco-purulent secretion on which essentially depends the condition denominated *ozæna*. *Ozæna*, then, may be simply the result of a condition like that which has been just described, allowed to progress too far without treatment; and if so, it must be treated on the same principles, the offensive discharge must be constantly removed by means of a syringe used freely, with a good and steady stream; if well done, no muco-purulent secretion will be allowed to remain to decompose, and, as a result, the one most troublesome symptom of fetor will be removed and in future be prevented.

Medicated lotions in such examples are seldom required, although in obstinate cases some slight stimulant, such as the sulphate or chloride of zinc, or nitrate of silver, may be employed, in the strength of about one grain to the ounce of water. This practice I have followed for some years, but it has of late been ably brought before the notice of the profession by Dr. Druitt.

But *ozæna* does not always depend upon such simple local conditions; in some instances ulceration of the passage in some part may be not only suspected, but with the speculum can be observed, and an occasional escape of a blood-stained, muco-purulent secretion should lead the surgeon to suspect the existence of such a condition.

Indeed, it is pathologically correct that such an ulceration should at times take place; inflammation of the Schneiderian membrane is the pathology of the cases we have last described, and at the present time ulceration of the same tissue claims our attention.

The principles of treatment, however, are the same—tonics constitutionally, with cleanliness locally; topical stimulants may be employed when simpler means have failed, or when great indolence of the part is present.

But the retention and decomposition of the morbid secretions being the cause of the fetor, by proper treatment this *ozæna* may be soon destroyed. By constitutional means, combined perhaps with local, the causes or rather pathological conditions

upon which the disease depends may be removed, and a recovery ensue.

Much time, however, is frequently required to ensure such a result, several months being not often too long; but as the fetor is the chief symptom of annoyance to the sufferer, such may speedily be removed by the mechanical and local means already suggested, and thus the worst feature of the disease is destroyed, and the mental as well as the physical comfort of the patient secured.

Let, however, this inflammatory action and perhaps ulceration continue, and a different result will follow. As we see in other parts, so we find in the nose, the bone itself becomes involved, inflammation takes place, and as a result necrosis follows. In so-called strumous subjects this condition is not infrequent, although I have no evidence to give that such a necrosis is always the result of the extension of the inflammation from the soft parts around the bone to the bone itself; in many cases if not in the majority, I believe the disease originates in the bones, for we well know that strumous subjects are very liable to an otitis and periostitis of a low form, followed by necrosis, whether the result of an injury or otherwise.

In the nose such a necrosis is not an infrequent condition, and is, as a consequence, another cause of the disease described as *ozæna*. It is found in children, as well as in adult life, and may be the result of injury, extension of disease from the soft parts covering the bones, or associated with the so-called strumous diathesis, or syphilitic poison. At times it may take place without any such distinct cause, it being well known that inflammation of the bone in other parts may also arise *per se*, and no visible or positive cause being made out, it is then described as idiopathic.

When produced by necrosed bone, the fetor is generally of a peculiar character, being such as is well known to accompany diseased bone. By careful examination with the speculum or probe, bone will often be detected, whereby the nature of the disease becomes tolerably evident; in early life, I have been lead to believe that inherited syphilis is a more frequent cause than is generally suspected, and this opinion has been made clear by the presence of other marked symptoms, such as old skin diseases, syphilitic teeth, or keratitis.

To form a correct opinion, a careful history of the case must be obtained, and well-known symptoms not overlooked, for unless an accurate knowledge of the cause can be acquired, the treatment to be adopted must be doubtful, and consequently will be unsuccessful.

Treatment.—When the presence of necrosed bone has been made out as a cause of the disease called ozæna, it is tolerably evident that the patient will not recover until the fetid bone has been removed, or rather has exfoliated. To this end the preservation of perfect cleanliness by means of the syringe, with or without stimulating or antiseptic lotions, may be employed, and tonics administered. If syphilis, either hereditary or acquired, is the apparent cause, our remedies must be modified to the general requirements of the patient. Mercurials are seldom necessary, although in children suffering from this disease, where the history and other symptoms of congenital syphilis are present, I have given them, associated with tonics, with marked benefit, and in obstinate cases in adult life such a combination may also be employed. The bichloride or iodide have proved themselves the best forms in my hands, and when combined with other tonics, such as quinine, bark, or iron, they are most valuable. The bichloride I generally give with bark, and the iodide in pills at bedtime, with the syrup of the iodide of iron and the iodide of potassium in some bitter, as quassia. If mercurials are not indicated or required, although syphilis be suspected, the latter recipe of iodide of iron and potassium cannot be too highly praised.

In strumous subjects, perfect local cleanliness, and perhaps stimulants, accompanied with tonics, as cod-liver oil, quinine, iron, or their combination, generally suffice, and a cure may confidently be promised.

CHAPTER VII.

ON SURGICAL DISEASES AND INJURIES OF THE LARYNX.

On Foreign Bodies in the Air-passages.

There are few accidents which excite more anxiety and alarm to a looker-on than the passage of a foreign body into the larynx or trachea. The unfortunate subject, from apparent health or happiness is suddenly seized with violent struggles for life, and to all appearances that life is to be curtailed, and its value exchanged for a sudden and painful death.

In the surgeon, not less painful feelings are excited, for unless by his art timely relief can be afforded, the danger which is apparent becomes real, and death is almost a certainty.

The majority of the victims of such an accident are children, although adults are not exempt from such a contingency.

The foreign body may be inhaled at any moment, a sudden inspiration being sufficient when the mouth is full, especially when that foreign body is smooth, light, or small, such as a stone, bead, nut, or coin.

The body may be lodged at the orifice of the larynx, and thus by its occlusion sudden asphyxia may be produced.

But in the majority of instances it passes into the rima, where it may be arrested, or it passes through into the trachea or bronchi, the left being its most common seat.

I have before me eight examples of such an accident; five were three years old and under, and three between the eighth and ninth year.

In all tracheotomy was performed. In five the foreign body was ejected immediately upon the opening of the trachea, and in four of these recovery ensued. In the fifth, everything went on well for three days, when broncho-pneumonia set in, destroying the patient on the eighth day.

In the remaining three cases, although tracheotomy was performed, the foreign body could not be removed, and death ensued.

CASE.—The first was in a child three years of age, who was admitted one hour after the accident, the foreign body being supposed to be a piece of nutshell.

The respiration was much impeded, air at times passing into the right lung and at others into the left, as if the body acted alternately as a valve, occluding by turns each bronchus; no paroxysm of dyspnœa, however, took place. Tracheotomy was performed by a free incision, but without avail, the character of the respiration remaining unaltered; and nine hours after the operation, and ten after the accident, the child died in a paroxysm of coughing.

After death the morbid appearances of acute bronchitis were present, the tubes being filled with tenacious mucus, in some parts completely obstructing the passage of air into the lungs, which were airless. A piece of nutshell was found in the rima, between the cords, and quite moveable, evidently having been ejected so far in the last act of life.

Remarks.—When the trachea had been opened, all means adapted for the removal of the foreign body were employed, such as a violent shake on the back and the dependent position of the head, but without avail. Thinking that the body might be lodged in the larynx, a probe was passed upwards through the rima without difficulty, no obstruction being detected; and, indeed, the general symptoms, or rather the character of the respiratory act, indicated an obstruction beneath the opening, as it was unaltered when the trachea was opened, and this would not have been the case if the obstruction had been above the seat of operation and in the larynx. The foreign body must have been firmly impacted at the bifurcation of the trachea, as there were no symptoms of its having moved after its first introduction, until the final scene. The respiration was impeded from the first, but no paroxysm of coughing ever took place.

It was pathologically interesting to see how rapidly the irritation of the foreign body had excited acute bronchitis, the tubes being filled with tenacious mucus, some smaller ones, indeed, being blocked up, causing complete occlusion of the air, and all this in the space of nine hours.

CASE.—The second was in a boy aged three years, who

accidentally, when at play, inhaled a small haricot bean; there was some slight difficulty of respiration immediately after the accident, but not sufficient to cause much alarm to the parents, but as this gradually became worse they brought the child to Guy's just sixteen hours after the accident.

When admitted, the respiration was difficult, but steady; the child's head was thrown back, and its veins somewhat congested; on examining the chest the right side was completely paralysed, no air passing into the right lung. It was tolerably evident that the right bronchus was the seat of the obstruction. Tracheotomy was at once performed, but without benefit; the bean did not move, and the child died about forty hours after the operation, and fifty-six after the accident.

After death the right lung was found to be completely collapsed. The whole air-passages were acutely inflamed, the glottis swollen, and the larynx and trachea covered with membranous lymph as in croup, but to a less extent. Firmly impacted in the right bronchus there was a bean, which completely filled the tube; it was removed with difficulty, having evidently much swollen from the moisture with which it was surrounded. The lungs themselves were healthy.

Remarks.—In this example the unfortunate termination of the case may fairly be set down to the lengthened period which was allowed to elapse before relief was sought; if tracheotomy had been immediately performed, the foreign body would probably have been removed, as it was of a smooth and easily moveable character, and was not likely to have been caught or entangled by the mucus or other parts; but as so many hours had passed over before the operation, by its swelling it became completely impacted, and the chance of success by operation was rendered very feeble.

CASE.—The third fatal example which I shall quote was in a child but eleven months old; one hour previous to its admission, when drinking some broth, it was seized with violent coughing, and this was followed by difficulty in breathing. The symptoms at first were very severe, but they gradually abated; as the laboured respiration, however, continued, the mother brought the child to the hospital.

Upon examining the chest, air entered both lungs, although

not freely, the respiration was evidently impeded and of a crowing character, and much venous congestion was present.

Tracheotomy was at once performed, although without benefit; the wound was subsequently left open by the dresser, but no indications of any movement of the foreign body showed themselves, and three hours after the operation, and four after the accident, the child died.

After death the lungs and bronchi were found healthy, some little emphysema existed in the anterior mediastinum and around the thymus gland. Sticking in the rima, and projecting through the top of the glottis, was a piece of bone which exactly filled in the space between the vocal cords, and was firmly impacted; no breach of surface was detected.

Remarks.—Upon the conclusion of this case but one feeling could be entertained, and that was of disappointment that a more careful exploration of the larynx had not been made; if any probe or other instrument had been passed upwards towards the rima, the body might have been discovered and its removal ensured; or even if the finger had been passed downwards from the mouth it must have been detected. I am not prepared to say that such measures were not adopted, as I believe they were, but it must have been clear that the means employed were not sufficient, or a different termination might have ensued. The child died quite quietly, asphyxiated, without any paroxysm of coughing, so that the bone could not have been ejected into the position where it was found, before death, as appeared to have been the case in the first example related.

From the consideration of these three fatal cases several practical points present themselves to our notice.

The first, as shown in Case 2, is the necessity of a speedy operation. If such had been performed in that example a different termination might fairly have been expected, for if the body is soft, an enlargement, by simple swelling, is sure to take place; and if the body is light, pointed, or rough, such as a nutshell or bone, by its irritation to the bronchial membrane it is certain to excite acute and rapid inflammation, and the resulting tenacious mucus is tolerably sure to prevent its being ejected.

A second point may also be learned from Case 1, which I

believe should always be acted upon, and that is, when tracheotomy has been performed, and the foreign body has refused to move and to be expelled, the opening in the trachea should be made very free, and its edges either kept open by some mechanical means, or a piece of its anterior surface should be cut out, in order to allow the foreign body to be ejected, should it by some fortunate act of coughing be displaced. In this case it appears that the nutshell, although evidently originally situated at the lower portion of the trachea, was subsequently expelled upwards, and not only passed by the large vertical opening in the air-passages made by the operator, but became impacted in the larynx and caused death; and it is fair to believe that if the plan suggested had been acted upon, the nutshell would probably have passed externally, and a more fortunate termination of the case have been the result.

The third point, as illustrated by Case 3, is of no less consequence than the two others, namely, when the trachea has been opened, a very careful examination should always be made of the larynx, both by the probe as passed upwards through the wound and by the finger as passed downwards through the mouth; in the example quoted, if this practice had been adopted, perhaps a different result might have taken place; at any rate the practice appears to be a good one, and can never do any harm.

Having carefully considered the fatal cases, in which the foreign body could not be removed by tracheotomy, and having drawn a few practical points from their consideration, it may not be without benefit to consider for a few minutes the cases in which the foreign body was removed, and to see if our previous conclusions are in any way supported by the facts in them detailed. There are five examples, in four of which recovery ensued, and in the fifth acute broncho-pneumonia proved fatal on the seventh day.

In the four successful cases the foreign body in two was a cherry-stone, in one a large glass bead, and in one the core of an apple. In the fatal case a nutshell was the offending material.

In one case, the cherry-stone had been in the air-passages for five days, causing at times severe paroxysms of coughing ;

it occurred in a boy aged nine years; the foreign body was immediately ejected upon opening the trachea.

In the case of the bead, in a child eight years old, the operation was performed on the second day, a flap being made in the trachea, including two rings; and the body, which weighed twenty-seven grains, and was nearly three quarters of an inch long, was rapidly ejected.

In the case of the apple-core, which occurred in a child fifteen months old, and was operated upon six hours after its introduction, the core was removed in the nail of the operator, when introduced downwards through the wound in order to examine it; the foreign body having been thrown upwards in the act of coughing.

CASE.—In the secondary fatal case, which was in a child fourteen months old, the operation was performed one hour after the accident. The trachea was opened, but no foreign body was expelled; the larynx was then carefully searched from above as well as from below, and the nutshell was found within the rima, and on being tilted upwards, by means of a probe, it was swallowed and the proof was lost; the operator, however, distinctly felt it with the probe as introduced from below and with the finger from above.

Everything progressed well for three days, when acute broncho-pneumonia set in and destroyed the patient; which was confirmed by the post-mortem examination.

By these examples the benefit of speedy relief is well exemplified, although, when the foreign body is smooth, the irritation caused by its presence is evidently less, and longer delay may undoubtedly be tolerated.

In the case of the glass bead, which was three quarters of an inch long, the benefit of a large opening and of a flap in the trachea was well demonstrated; and in the last case, although a fatal one, the benefit of carefully examining the larynx was clearly proved.

Upon the whole, the lessons to be gained by the consideration of the successful cases are the same as those drawn from the fatal; one series confirming the accuracy of the other.

It would then appear, as indeed our reason would lead us

to infer from the consideration of these cases, that the smoother the foreign body, the more tolerant of its presence are the air-passages, the greater certainty is there of its removal, and the chance of a fatal inflammation is diminished.

The lighter and more rigid the foreign body, the greater the likelihood of its being fixed in the larynx, the greater its liability to become entangled in the trachea, and the greater the chance of an acute inflammation of the air-passages; and, as a consequence, the probability of its removal becomes lessened, and also the hopes of a subsequent recovery.

CHAPTER VIII.

ON ŒDEMA OF THE LARYNX FROM SWALLOWING BOILING WATER.

The habit amongst the poor of feeding their children out of a teapot, has engendered the not infrequent accident, which forms the text of this chapter. The child, in its anxiety to obtain drink, seeks it from the kettle on the fire, and so scalds the pharynx and orifice of the larynx that œdematous inflammation of the parts follow, in the same manner as a blister would be produced by the application of boiling water to any other tissue.

The symptoms caused by such an accident, as a rule, appear speedily after the application of the fluid, and the small chink in the glottis becomes so rapidly closed, that unless early relief can be obtained, a fatal result must almost necessarily take place.

I have before me notes of twelve examples of such an accident, all taking place in children under three years and a half of age. In two of these the injury was so slight as only to produce some difficulty in respiration, not sufficient to necessitate any operative interference; and recovery took place by simply keeping the child in bed, with warmth externally, and in a warm temperature.

In nine cases, tracheotomy was performed, and in five of

these with success; in the remaining four a fatal result ensued. In one the symptoms were so slight that an operation was not deemed requisite, but a sudden attack of spasm took place half an hour after its admission into the hospital, and two hours and a half after the accident, which put an end to life.

CASE.—The child was three years and a half old; the respiration was difficult, but not laborious, at any rate not sufficiently so to induce the surgeon to perform tracheotomy. At the post-mortem, the mucous membrane covering the pharynx and epiglottis down to the superior vocal cords was shreddy, œdematous, and thickened, and the larynx contained a frothy mucus. The trachea and bronchi were congested, and filled with mucus. The lungs also were gorged with blood. The cervical veins were much distended. Heart healthy, with right side full of blood. Viscera healthy.

Remarks.—It is hardly fair to say, that if an operation had been performed in this case, a successful result might have been obtained; nevertheless it was so believed by some who had watched it and had regarded the post-mortem appearances. Death had evidently been caused by a sudden spasm of the laryngeal muscles, and not by the rapid or gradual mechanical closure of the glottis by the œdema of the parts. To my mind, the lesson to be learnt from the case was not to delay the operation too long. If the case is not very threatening in its nature, but becoming worse, do not wait till the lungs and veins are all turgid with blood, and consequently are all disposed to inflammatory action, and are certainly not favorable to recovery; but operate at once, and thus put an end to the great risk of all these cases of œdema of the glottis, namely, spasm and sudden death.

In the following case death was imminent by the spasm of the larynx coming on during the operation, and life was saved only by opening the trachea. It is true that death subsequently ensued from broncho-pneumonia, but this does not interfere with the value of the practice.

CASE.—A child, æt. $3\frac{1}{2}$, was admitted into Guy's, eight hours after drinking boiling water from a tea-kettle, with all the

symptoms of approaching asphyxia from œdema of the larynx. Tracheotomy was at once performed, and during the operation a most violent spasm took place, followed by the cessation of respiration; and it was only after the long-continued action of artificial respiration that life was prolonged. Relief speedily ensued, and no bad symptom made its appearance. On the fourth day the canula was removed, and the child appeared convalescing. On the eighth day it was as cheerful as usual, ate, drank, and slept with all the symptoms of health, and its voice had quite recovered its natural tone. On the tenth day, however, it suddenly lost its voice, became hoarse and feverish. Inflammation of the lungs rapidly came on, which, on the fifteenth day, proved fatal.

After death all the evidences of acute inflammation of the whole air-passages were seen. The mucous membrane was acutely inflamed, and the tubes were filled with mucus, the lungs themselves being also involved.

Remarks.—In this case the cause of death was too clear, but it is hardly fair to assign it altogether to the accident or to the operation; from the immediate effects of both, recovery had apparently taken place, and no single sign of mischief remained except the granulating wound in the neck from the operation; the opening in the trachea had closed for some days, as the voice was natural and free from all indications of obstruction. The inflammation of the air-passages I am disposed to regard as accidental, the original injury and operation having increased the tendency to such an attack.

In the case which I propose now to relate, a complication was present which I have observed in several instances, namely, the appearance of the milk which the child drank at the orifice of the canula, and which had evidently made its way down the larynx, and been expelled through the artificial opening.

CASE.—A boy, æt. 18 months, was operated upon twelve hours after the swallowing of the boiling liquid, the symptoms having gradually become worse; everything progressed well for three days, when acute broncho-pneumonia appeared, proving fatal on the fourth day. Twelve hours after the operation

milk was first observed at the tracheal opening, and on many subsequent occasions the observation was repeated. In many like instances the same appearances have presented themselves, and it only remains to find an explanation of the fact.

Remarks.—I well remember the alarm which such a symptom excited in the mind of a surgical friend when he first observed it, as the fear had passed through his mind that the œsophagus had been wounded during the operation, and that such a channel allowed the milk to pass through. This fear is, however, completely groundless, as repeated observation has convinced me of the fact when no such error had been committed, and I believe the milk is allowed to pass, simply because the epiglottis and glottis are so injured as to cease to act as valves, and have also by the scald become so blistered, and thus insensible to impressions, that a foreign body may pass without exciting any irritation. The fact, however, remains—the milk does pass, and that without exciting cough or other signs of irritation, unless in large quantities, when it passes downwards into the tubes and excites cough.

In the case just quoted it was a question in my mind whether it might not have been the irritation of the milk and other food which had subsequently excited the inflammation of the lung; at any rate, it must have considerably aided this result.

At the post-mortem the epiglottis and glottis were found to be somewhat swollen, but not to any great extent; the whole air-tubes were inflamed and filled with mucus; the right lung was completely consolidated, the left lower lobe partially so. The remaining viscera were healthy.

When there are symptoms of milk or food making its appearance at the orifice of the canula, it becomes a question whether it is right to give fluid by the mouth, and whether it would not be better to feed the child through a tube passed down into the œsophagus. I am disposed to believe it would, and in another case I shall be disposed to adopt the practice.

The five successful cases possess no points of special interest; in one only were there any signs of pneumonic mischief, which was treated by small doses of antimonial wine with marked success; in the remainder everything progressed

as favorably as could be desired. The canula was removed at the end of three, three, five, eight, and twelve days respectively, that is, as soon as the larynx allowed the passage of air. This rule is especially worthy of attention, as a canula can only be regarded as a foreign body, and the sooner it can be dispensed with the better. By way of summary—

In such accidents, if the symptoms are increasing and of any severity, operate at once, and remove the tube on the earliest opportunity; if symptoms of pneumonia appear, treat it with antimony, although with care; and if the larynx allows the food to pass downwards into the trachea, consider whether it would not be the best practice to prevent such a contingency taking place, and feed the patient through a tube passed downwards towards the stomach.

Delay in operating has been shown to be dangerous by the cases related, and although there is always danger in the operation, and more particularly danger from pneumonia, tracheotomy should be performed. It is difficult to say how much of this pneumonia is due to the accident and how much to the operation; the operation, however, appears a necessity, to remedy a temporary mechanical obstruction to respiration, and unless that obstruction can be removed, death is imminent. Surgeons of late have suggested the propriety of scarifying the œdematous mucous membrane. If such can be done with facility and with success, the propriety of such a measure cannot be doubted. I have no personal experience to give upon this matter, and can only therefore recommend the consideration of the subject to my surgical brethren.

CHAPTER IX.

ON TRACHEOTOMY, AS REQUIRED IN ORGANIC DISEASES OF THE LARYNX OR ITS NEIGHBOURHOOD.

It is not my intention to enter upon the extensive, but interesting, subject of organic disease of the larynx; nor to dwell long upon the pathological conditions which may require such an operation as tracheotomy or laryngotomy; but

as every practical surgeon must at times have been called upon by the physician to come forward to his assistance, and to do his best to prolong the life of his patient by the opening of some portion of the air-passages, I hope to be able to illustrate this part of my subject by some few interesting cases, and to bring out by their consideration some points worthy of attention.

When the anatomy of the larynx and the delicacy of its structure is considered, it is easily understood how any disease producing a thickening of the glottis, or of the rima, should excite symptoms of suffocation; and that chronic inflammatory conditions affecting these parts, whether involving the cartilages, soft parts, or both, cannot continue for any lengthened period without affecting more or less the function of respiration.

Under the name of strumous or syphilitic disease of the larynx, the majority of the cases of chronic inflammatory affections of the larynx are generally grouped; it is for such that the surgeon is often consulted with the view of some operative interference, and it is in such that his assistance is often of great value.

There are other affections of the glottis which may also require surgical treatment.

Inflammation and ulceration of the soft parts around the cartilages may be caused by ossification and the subsequent death of the cartilages themselves, and in these instances tracheotomy may be demanded.

Warty and other growths, whether simple or malignant, may grow from or involve the upper portion of the larynx; and thereby obstruct the respiratory effort and require a like surgical interference; and lastly tumours originating external to the trachea may so enlarge, press upon, and impede respiration, that the opening of the trachea may be called for.

But whatever the pathological conditions may be which cause an obstruction to the respiratory act; and however interesting the study of such must ever be to the scientific surgeon, in practice these distinctions become of small value, as the assistance of the surgeon is commonly required in an emergency, and he is called upon by his art to prevent, what is too evident, asphyxia and a rapid death. Under such cir-

circumstances all pathological distinctions are put aside, and it remains only for the surgeon to decide whether he will stand by, with his hands folded, and watch the victim of disease gradually asphyxiate, or by his art open the trachea, and thus do his best to prolong, if not to save, the life of the sufferer. It is true that the position of the operating surgeon in these cases is one of difficulty, as his knowledge too often tells him that the operation can but briefly prolong the life which may be an agony; but the laws of our profession and of humanity are fortunately binding, and it is not for us to judge of the expediency of the measure, but at all hazards to advise and to carry out such measures as offer a fair prospect of temporary relief and of prolonging life. Under such circumstances laryngotomy or tracheotomy should be performed, and it remains for me briefly to quote a few examples illustrating this interesting subject.

CASE.—*Syphilitic disease of larynx, requiring tracheotomy; canula worn for twelve years; foreign body in trachea; opening enlarged; recovery.*—Sarah C—, æt. 28, was admitted into Guy's Hospital on June 16th, 1847, under the care of Mr. Hilton. She was a pale, cachectic-looking woman, who had lived very irregularly, and had had syphilis. On admission her throat was extensively ulcerated, and the larynx was evidently involved; her breathing was stridulous, and 13 in a minute. As her symptoms rapidly became worse, and as suffocation appeared probable, tracheotomy was performed. For some days afterwards her cough was most troublesome, the mucus at times obstructing the tube, but these symptoms soon subsided, and at the end of the third week she was able to get about, and appeared convalescent. The ulceration of the soft palate gradually healed, her strength improved, and seven weeks after the operation she left the hospital, still wearing the canula.

Six years subsequently the patient was again admitted into the hospital for some bronchial affection; in the interval she had married and had borne three children. The means of subsistence having been very scanty during this period, she had undergone much privation, and had been exposed to all the changes of temperature. Slight attacks of bronchitis had at

times oppressed her, but she would never take any care of herself, nor wear any light covering over the orifice of the canula. The tube had been cleaned every four months, and more frequently when the mucous secretion was very copious, which passed freely through it; none whatever, not even air, passing through the larynx.

At the interval of another six years she was again admitted, having in the morning, when cleaning out the tube with a piece of twisted tape, broken off the end, leaving it in the trachea; she immediately was seized with difficulty in breathing, and went off to Mr. Hilton's residence, who sent her on to Guy's. She was admitted under my care, and as it was found impossible to remove the body without enlarging the artificial wound downwards, such an operation was performed; the rings in the trachea being very hard; the foreign body was at once expelled, and all difficulty in respiration ceased. Everything progressed well, and in a few days she returned home convalescent.

Remarks.—This case must be regarded by every one as of peculiar interest; there was little doubt as to the nature of the disease, as a syphilitic history was tolerably clear; there could have been none as to the propriety of the operation, as death appeared imminent; and the success of the treatment is well proved in the lengthened period of life which has been vouchsafed to her.

The opening of the glottis appears to be completely closed, not a particle of air being allowed to pass, and it is a subject of interest to watch her in her efforts to articulate and make herself understood; of course this is done merely by her mouth, but she shapes her lips so well that it is not difficult to understand all she says.

The fact that this patient has worn the tube twelve years and upwards is a proof that the trachea becomes at last very tolerant of a foreign body, and also that the body itself is well adapted for its purpose. The shape of the canula is exactly similar to that which is ordinarily employed. The occasional attacks of bronchitis are in a great measure due to her carelessness and necessary hardships of her life; she is very poor, with a large family, and will not take the trouble to wear even a muslin shade over the tube, even in the coldest and dustiest weather.

I know of no case more encouraging than the above, and have therefore given this somewhat extended account.

In the case just quoted tracheotomy was performed as the disease appeared extensive, and it was thought more desirable to operate on the trachea and thus be sure of being below the seat of the malady; such a practice, however, is not always necessary, and when the disease appears confined to the upper portion of the larynx, involving only the opening of the glottis or vocal cords, the operation of laryngotomy should be selected, as being a simpler and equally efficacious operation.

In the following example such a practice was adopted, and well displays the benefit of the practice employed.

CASE.—A man, æt. 30, of a healthy constitution, contracted syphilis in 1850; in 1855 the constitutional symptoms had not left him, and in August, 1859, he first observed some huskiness in the larynx and occasional pain. He thought little of it at the time, but as it gradually became worse and caused some difficulty to respiration, he was admitted into Guy's Hospital under the care of Mr. Coek. When seen, there were no general symptoms of constitutional syphilis. He was a healthy looking man, and the only symptom which was to be observed was a laboured breathing, evidently the result of contraction of the laryngeal orifice. The parts about the larynx were slightly thickened, but not to any great extent, and manipulation gave no pain. He was carefully watched for some time; indeed, nearly four months elapsed before any operative interference was imperatively called for. Laryngotomy was then performed by Mr. Poland with great benefit. His respiration became quite natural, and no bad result ensued, the man leaving the hospital some weeks afterwards, wearing the tube.

In this example the disease was evidently located at the orifice of the larynx; some ulceration had existed, and by its subsequent cicatrization contraction of the orifice, if not closure, was threatened. The operation of laryngotomy was in this case unquestionably to be selected, and the benefits accruing from the operation justified the step.

CASE.—I have the notes of a third case, which is equally favorable, and which equally indicates the value of tracheotomy ; it occurred in a man aged forty-two, who was admitted in a dying condition from obstructive disease of the larynx, a history of syphilis being tolerably clear. Tracheotomy was at once performed, and a rapid convalescence followed. At the present date, three years and a half after the operation, he is in good health, with the tube constantly in, the larynx being completely closed.

In the three cases which I have quoted a syphilitic poison was evidently the original cause of all the mischief, and it is in such examples that the benefit of laryngotomy is well demonstrated ; the local symptoms produced by the disease, although serious and threatening life, are remediable ; and by treating the local disease together with the constitutional, the immediate danger may be counteracted, and time be given for remedies to act ; thus in a measure neutralizing the systemic affection. By the operation, rest is given to the part, and the healing process is consequently encouraged. Whenever ulceration of the larynx arises from such a constitutional cause as that which is generally described as struma, the same good results cannot be shown, and I am unable to quote from my own experience a single example in which tracheotomy has been performed and life saved, that is, extended to a degree equal to the last cases which I have given.

I can quote a case where death was delayed by the operation, and where the patient's last days were rendered more endurable ; but the local disease continued as well as the more general, and destroyed him twelve days subsequently. Such a result is only that which must, as a rule, be anticipated. For this form of ulceration of the larynx is generally but a symptom of a constitutional phthisical tendency, and is almost always associated with some pulmonary disease ; under such circumstances death from the local disease may be for a time delayed, but the deeper-rooted mischief still continues, and must eventually destroy.

CASE.—A woman, æt. 36, was admitted into Guy's Hospital under the care of Dr. Rees, with some laryngeal affec-

tion of ten months' duration. She was much emaciated and very feeble. Her voice was scarcely to be heard, and of a harsh character, so much so that she was with difficulty understood. The larynx externally appeared to be much thickened, and the integument over it was the seat of a strumous ulceration. She had incessant cough and expectoration, swallowed fluids only, and those with difficulty. There were marked symptoms also of some extensive pulmonary disease.

As the respiration became worse, and death from suffocation threatened, I was called upon to perform tracheotomy, which was followed by satisfactory results; her respiration was rendered easy, she took food freely and with relish; she slept well, and was comparatively greatly relieved. But such benefit continued only for a few days; pneumonic mischief developed steadily and rapidly, and on the twelfth day she sank.

At the post-mortem examination the following conditions were detected :

The larynx was most extensively diseased. The right side of the epiglottis and vocal cord was entirely destroyed by ulceration. The right ala of the thyroid cartilage was exposed and of a green colour, portions being ossified and detached; the right half of the cricoid was necrotic and lying in a sloughing cavity, and externally a sloughing abscess existed surrounding the diseased portions.

The opening in the trachea was healthy. The tubes were inflamed, and their mucous lining of a green colour. The lungs were inflamed, masses of consolidated tissue being scattered throughout, some softening down, and one, the size of an egg, had become gangrenous.

Remarks.—In this case, however, the operation of tracheotomy afforded all the relief that was to have been expected—it delayed death and smoothed the pathway for the patient; extensive organic pulmonary disease coexisting, no more could have been anticipated, and the surgeon's art in this, as in other instances, was exercised more to alleviate than to remedy. It is not, perhaps, agreeable to that man's pride who would fain conquer and overcome, but surely the professional man's mission is not the less perfect when employed to retard the progress of disease, to alleviate its miseries, and to render that

death which is inevitable less painful and perhaps less rapid. It is by such acts that our profession confers the greatest blessings, and as surgeons we must as often operate to carry out these intentions, as to save life, and by so doing perform our duties.

I have thus, by cases upon which I have based a few remarks, illustrated the benefits which may be expected from the operation of tracheotomy or laryngotomy in ulcerations of the larynx, whether the result of syphilis or the concomitant of some phthisical disease; and have shown that in the former, if the constitutional powers are good and the chief disease is local, that a considerable extension of life, if not a cure of the disease, may with some confidence be anticipated. I have also expressed an opinion, and illustrated it by a case, that where this laryngeal disease is only a symptom of a more serious general affection, the operation, although equally called for, can only relieve, and that if it delays death only for a short period and relieves suffering its object is fulfilled.

I am by no means prepared to say that it is only in these two classes of cases that ulcerations of the larynx are to be found which require operative relief; I believe that they may take place independently of these constitutional tendencies, although it has never fallen to my lot to witness such severe instances, requiring a like treatment. There certainly is no reason why simple ulceration should not attack the mucous lining of the larynx, as it may attack other parts, unconnected with syphilis or struma; and there can be little doubt but that instances occur; although they may rarely extend so far as to necessitate the opening of the air-passages. Primary disease of the laryngeal cartilages may also exist, whether the result of their degeneration and death, or of any constitutional affection; giving rise secondarily to abscess and laryngeal obstruction, which may require operative interference.

But this is not the place to enter into the pathological conditions of the larynx which may require surgical aid; whenever disease of the larynx has so extended as to interfere with life's vital function of respiration, an operation for opening the air-passage must be performed, with the in-

tention of prolonging life, if not of curing the disease. I have before me three other examples where this operation was performed, and with only that view, death having been postponed but for a few days.

But affections of the larynx itself are not the only diseases which, by obstructing the air-passages, may require the surgeon's aid. Tumours growing externally to these parts may so enroach and press upon the trachea or larynx as to form an equal impediment, and the only means for relieving our patient may be by tracheotomy.

The following example is a good one, as illustrating such a condition, together with the beneficial results of such a practice.

CASE.—George W—, æt. 10 years, was admitted under my care into Guy's Hospital, on January 19th, 1860. He had been ill for two months with some enlarged glands beneath the jaw, and one month previously had observed a tumour situated in the median line over the trachea. For two weeks he had experienced some difficulty in respiration, and as this difficulty had rapidly increased, threatening suffocation, he came to Guy's.

When admitted, his respiration was most laborious and his face congested. In the median line, covering in the whole larynx and trachea, was a tumour, which extended equally on both sides, completely masking from view, even from examination, the larynx and trachea. As there was no doubt that life would soon be extinguished unless relief could be obtained, an incision was made in the median line through the centre of the growth; this was of a firm, fibrous character, and in the centre appeared to be breaking down, as some débris of structure escaped. The trachea was pressed completely backwards, and was found with difficulty, some care being required to open the tube. When this was accomplished, immediate relief was afforded to the patient. A wire splint round the neck was fastened at its ends to the cannula, to keep it in its position, as from its deep situation in the wound it was readily expelled on swallowing or on elevation of the larynx. Everything went on well, the tumour appeared gradually to disappear, and the boy's health to improve; on the twelfth day the tube was removed, the boy breathing without difficulty; the wound rapidly

healed, and he left the hospital convalescent, with some evident enlargement in the situation of the thyroid gland and its isthmus.

Remarks.—In this example of disease external to the larynx, impeding respiration, the operation of tracheotomy was imperatively called for, as asphyxia rapidly threatened the life of the patient. Its success was far beyond my most sanguine expectations, and the rapid subsidence of the tumour was as unusual as it was satisfactory. The character of the tumour which so rapidly lessened is still a subject of speculation; it is to be regretted that I did not, when the patient was under the influence of chloroform, excise a small portion for microscopical examination, and thus have learnt its true character.

It appeared to me, at the operation and on subsequent occasions, to have been connected with the thyroid gland, and it seems probable that it really was an acute inflammatory engorgement of that organ; its rapid, although not entire, disappearance pointed to such a pathology; it was exactly in the seat of the gland, which was fixed and immoveable.

The pathology of the thyroid is so little understood that probably this opinion may find many questioners; at the same time, from the history of the case as a whole, the situation of the tumour and its subsequent subsidence point more to the truth of this opinion than to any other, as it is quite against all our experience and knowledge to see a new growth, composed of new products, rapidly disappear, particularly when it had enlarged to such an extent as in the case just quoted.

Cases like the above are not numerous; they can occur only now and then. I have one other instance where relief was obtained by tracheotomy for a large cancerous tumour of the pharynx, pressing on the pharyngeal opening, but the man survived only three days. Nevertheless the operation was imperatively called for, and answered all its expected purposes.

CHAPTER X.

ON WOUNDS OF THE THROAT.

However accustomed the mind of a surgeon may be to the contemplation of injuries, the horrors connected with the wounds of the throat can hardly ever be regarded with complacency or without emotion.

If it be the act of the suicide, the mental condition of the sufferer adds with considerable power to the intense interest of the scene; and when the result of a criminal attack upon life, that interest is by no means lessened.

To nerve himself against the emotions which such a scene must excite, it becomes absolutely essential that the surgeon should dwell seriously beforehand upon the necessities of these cases, and thus in the hour of danger be prepared to act with energy and efficiency, by applying his skill to the exigencies that may arise.

I have before me the notes of 36 instances; in 22 of these the wounds were of a superficial character, merely dividing the integuments and superficial muscles, and not, therefore, endangering life.

In 10 cases the wound was situated at the side of the neck, in one above the os hyoides, in 10 between the thyroid cartilage and hyoid bone, and in one over the crico-thyroid membrane, but not dividing it. In only one of these did death take place, and that was the result of delirium tremens, in a fit of which he inflicted the injury.

In no one of these instances did any bleeding or important symptom show itself, the wounds being of a simple character. They were treated also by simple means, the edges brought together by sutures or strapping, and water-dressing applied.

Of the 14 examples in which the wound was of a severer nature, a very different result must be told, as in 7 of them a fatal termination ensued :

In 2 the wound was above the os hyoides.

- | | | | |
|---|---|---|---|
| 4 | " | " | between the os hyoides and thyroid cartilage. |
| 3 | " | | passed through the thyroid cartilage. |
| 2 | " | " | " crico-thyroid membrane. |
| 3 | " | " | into the trachea. |

In 4 cases only was there any hæmorrhage of sufficient importance to require the application of a ligature; in 2 of these death followed, in one evidently from the flow of blood: the fatal result—with this exception—being produced by other causes, the victims, as a rule, generally sinking.

To illustrate the dangers of a cut throat, the following cases may be quoted.

CASE.—An intemperate man, æt. 31—having for two weeks been under the influence of drink—after a domestic disturbance inflicted a severe wound in his throat above the os hyoides; some hæmorrhage followed, and in a delirious and half-conscious condition he was brought to the hospital. He was able to speak, and attempted to describe the method by which he had inflicted the wound; in doing so he suddenly became nearly choked, evidently by the divided tongue falling downwards upon the opening of the glottis. To prevent such a result, the dresser pulled his tongue forwards, and having passed a ligature through it, fastened the ends over the man's head. In two days the patient sank.

The necropsy revealed the extent of the mischief. The incision passed round the throat, above the hyoid bone, completely dividing the root of the tongue from its hyoid attachments, the anterior portion being only fixed by its lateral connections. The root of the tongue formed a loose flap, or valve, which covered over the epiglottis, and would evidently have caused suffocation if mechanical means had not been employed to keep the tongue forwards.

The carotids and their branches were untouched.

Remarks.—Such a complication as the above can only take place when the wound is inflicted above the hyoid bone, and is of a severe character; it was fortunate that assistance was at hand, as the man would undoubtedly have been asphyxiated by the tongue falling downwards and thus closing the glottis. The means employed to prevent such a result were unquestionably the best, and the case is quoted here merely to illustrate the contingency, and the correct practice to be adopted in like instances.

As an illustration of death from bleeding, the following is a sad one.

CASE.—A healthy man, æt. 21, was admitted into Guy's for some contused wound over the patella; from this he was convalescing, when, without the slightest indications of any mental distress or other cause, he cut his throat, dividing the thyroid cartilage, crico-thyroid membrane, with the superior thyroid artery, laying open the pharynx and trachea. The bleeding was profuse, and passing downwards into the trachea and œsophagus, produced sudden death from asphyxia.

Remarks.—This case is an example of a not unfrequent cause of death in cases of cut throat involving the larger vessels; the carotid and its branches are not, however, often divided; if they are, the immediate hæmorrhage must rapidly destroy; but if any small bleeding takes place, and the blood should flow into the trachea or respiratory passages, asphyxia must rapidly ensue. The example above quoted is a melancholy instance of such an accident.

The treatment to be adopted in such accidents is the next thing to consider, and indeed its simplicity is most remarkable. It is needless to say that if vessels are wounded they are to be tied, and all measures adopted to prevent any recurrence of the bleeding. That if the tongue should be divided from its hyoid attachments, as in the case quoted, the means there indicated should be employed to prevent suffocation. That if the wound be above the thyroid cartilages, and the epiglottis be incised, there may be a fear of the divided portion obstructing the rima, and thus asphyxia be produced. In such instances some measure must be employed to preserve the divided portions *in situ*, and a ligature or suture appears to offer the greatest advantages—a fine one being passed through the base of the divided portion, and fixing it to its natural position.

In other cases, where the larynx or trachea is wounded, the aim of the surgeon must be directed to keep the divided tube in continuity, and not to allow the upper portion to overlie the lower, and thus obstruct the respiration; at the same time the surgeon must do his best to keep the wounded parts sufficiently open to allow of the escape of the mucus, which is sure to be profuse, and to permit the free ingress of air.

Unless the wound be very extensive and there be difficulty

in carrying out the above indications, sutures are not generally required; the judgment of the surgeon and the exigencies of the individual case will sufficiently point out to the thoughtful practitioner when they may be necessary. In large wounds, where the parts cannot be kept together, a suture is often of immense benefit, and when applied they should be firmly so, including often the whole thickness of the tissues. Their object can only be to fix the divided parts in position, and to prevent by their sudden movement any mechanical obstruction to the respiratory act; to do this effectually, the measures to be employed should be boldly executed. The head should be kept forwards by the application of bandages, and water dressing applied to the wound itself; constant attention is demanded by the nurse to keep the wound clear of discharge and to see that no obstruction to breathing should take place.

As regards nourishment, abundance should always be provided, although it is not such an easy task to get the patient to take it.

When the pharynx or œsophagus is extensively opened, the patient should never be allowed to swallow, and he must be fed by means of a tube passed either through the nose or mouth, and directed with the finger carefully down the throat into the lower portion of the œsophagus. Through this, beef-tea, eggs, brandy, and other liquid nourishment, such as the symptoms indicate, must be administered periodically.

I have an instance before me where the pharynx was extensively opened above the os hyoides, and where the patient was kept alive by such means for nearly six weeks, the tube having been passed through the nose; at the end of this time he was able to swallow, and recovery ensued.

When acting as dresser to the late Mr. Aston Key I had a case where the wound was inflicted through the trachea, dividing the œsophagus; in such an instance the man was fed twice daily through a tube passed through the mouth and directed with care into the lower œsophageal opening; this practice was carried on for many weeks, and was rewarded by recovery. The plan of treatment as just indicated, however, is only rational, and is such as any surgeon would naturally suggest.

CHAPTER XI.

ON INJURIES TO THE THORAX.

The diseases and injuries of the nose and larynx requiring surgical assistance having been briefly illustrated, and examples quoted indicating their various morbid conditions and the correct treatment by which those conditions should be met; it remains for me to review in a like manner the injuries to the chest, and to cduce from their consideration some rules of practice which, having proved successful in a large variety of cases, may confidently be recommended in similar instances.

Fractures of the ribs will first engage our attention, and we will then proceed to consider the various complications which may be associated with such an injury.

SECTION I.

On Simple Fracture of the Ribs.

Basing my remarks upon the notes of such cases as have passed beneath my own observation, I find that I possess 108 examples of simple and uncomplicated fracture of the ribs. In some instances the number of ribs involved were very numerous; in others one, two, or three alone were fractured; in none, however, were there any symptoms of emphysema or of injury to the lung.

The seat of fracture was very variable, the majority of cases taking place from a direct blow; the angle or centre of the rib was the usual seat, but the sternal extremities were by no means rarely involved.

In eight of these cases alone, or in 7·4 per cent., did any subsequent inflammatory affection of the pleura or lung make its appearance, and in two of these a fatal result ensued.

CASE.—One case was in a man æt. 55, who had been distressed by an old bronchitis for some years. Having fractured his left ribs by a fall upon his side, a bandage was applied. In twenty-four hours acute broncho-pneumonia set in, from which he sank on the seventh day.

The post-mortem revealed a fracture of his left sixth, seventh, and eighth ribs, about their angles, together with the evidences of chronic bronchitis and recent pneumonia, with granular kidneys. There was no evidence of any injury to the lung from the accident.

Remarks.—In this instance the fall and fractured ribs undoubtedly occasioned death; but would not any other accident have been followed by the same result? A man with diseased kidneys and old pulmonic disease always stands, as it were, upon the brink of a precipice, and the slightest injury or accidental affection carries him down.

CASE.—The second example is not unlike the preceding one; it took place in an intemperate carman, æt. 37, who fractured, from a fall, his fifth, sixth, and seventh ribs, about their angles, two days before applying for advice. He had continued at his work during this period, having been drunk more or less all the time. Prior to his admission he brought up about two or three pints of blood, but it could not be accurately made out whether it was by vomiting or coughing. When admitted there was great difficulty of respiration, and universal bronchitis. He was bled from the arm, and antimonials, with salines, given to him, with great relief, but the hæmorrhage continued all night, and he died the next morning.

After death the remains of an *old* apoplectic clot was detected, about the size of a nut, situated on a level with the roof of the right lateral ventricle. The brain was otherwise healthy. The left fifth, sixth, and seventh ribs were fractured about their middle, but no displacement had taken place. The right lung was adherent and the pleura thickened, indicating old disease. The bronchi were inflamed, the mucous membrane being deeply injected; the tubes were filled with a frothy mucus, and the lungs were in the first stage of pneumonia. Above the aortic valves was an aneurism, the size of an egg, communicating with the aorta by a large, round opening, its walls being continuous with those of the aorta; it was empty and free from clot, its lining was very thin, but no opening could be detected in it. The viscera were healthy.

Remarks.—From such a condition of body no surprise could be entertained that death should have followed upon

such an accident as fractured ribs. The source of the hæmorrhage could not be made out, and therefore remains a mystery. The stomach and lungs were free from any extravasated blood, and although a careful search was made, no other part gave evidence of any mischief as would explain the hæmorrhage.

The case is quoted here, however, simply as an example of death after a simple fracture of the ribs, although not from it.

In the remaining six cases, which were complicated with some pulmonary inflammation, all the symptoms were subdued by the free administration of antimony; in one alone was any mercurial combined, and in one only was there a preliminary bleeding performed.

In the majority of such cases the effect of antimony is very striking, given in the form of the wine, in twenty- or thirty-minim doses, every three hours. The pulse becomes lower, the respiration less hurried and more easy, and the skin soon takes on a free action; when this occurs let the dose be diminished or given less frequently, as by such means the patient is generally relieved and the disease arrested.

The treatment of these cases of simple fracture is very simple; the aim of the surgeon is to keep the ribs at rest, and thus allow nature to repair the mischief; this used to be sought for by the application of a bandage firmly rolled round the chest, but experience has taught that this practice is not only a very uncomfortable, if not a painful one, but that it has the great disadvantage of confining and restraining the action of both sides of the thorax. The plan which is usually employed at Guy's Hospital, and which I most strongly recommend, is the application of long strips of thick plaster, about one and a half to two inches broad, and long enough to extend from the spinal column to the sternum, each strip when applied overlying the one above for half its width; by this means the injured ribs are kept absolutely at rest, whilst those of the sound side are left free; there is little or no inconvenience from the application, and it is more durable and more efficacious than the old one of a bandage.

SECTION 2.

On Fractured Ribs and Emphysema.

Having thus briefly dwelt upon the cases of simple fracture of the ribs, uncomplicated with any other local injury, and shown by statistics that it is by no means a fatal accident, unless taking place in patients so diseased that the slightest interference with any of the bodily functions is likely to terminate in death; and having also alluded to the valuable remedy of antimony in the treatment of such pulmonary inflammation as takes place in but a small per-centage of the cases under consideration; I now pass on to consider those cases of fractured ribs complicated with emphysema, but not associated with any hæmoptysis or other symptom of injury to the lung itself; and in doing so the evidence which I can bring forward is nearly as satisfactory as it was in the former class of cases.

Simple emphysema and fractured ribs are by no means a very fatal combination, although it would appear, as it might fairly be anticipated, that a secondary pulmonary inflammation is a more frequent complication than is found to exist in the former simpler cases. The fact that emphysema is present is a sufficient proof that the lung itself is injured, although that injury must be very slight if the emphysema alone is the only symptom of lung mischief. In sixteen examples which I possess, such, however, was the case; in nine of these no bad result followed; the emphysema was variable in its extent, and occasioned but little distress. The side was bandaged or strapped up, and all the symptoms gradually disappeared, the patients convalescing without a bad symptom.

In three cases some cough accompanied the accident; it was but slight and was readily relieved by anodynes; and in four instances, or in 25 per cent., evident symptoms of inflammation of the lungs existed. These were, however, speedily and efficaciously subdued by the antimonial treatment; twenty or thirty drops being given every four hours, with a sedative in the form of Dover's powder at night. Perfect rest was preserved, and abundance of bland, nutritious food given; by such measures I know of few cases which afford greater gratification to the surgeon, as the patient from great distress becomes speedily relieved, and all danger rapidly subsides.

SECTION 3.

On Fractured Ribs and Injury to Lung.

The next class of cases which claims our attention is of a much more severe nature, and as a consequence is much more fatal in their result, as it includes all those instances of fractured ribs associated with evident symptoms of injury to the lung, as indicated by the presence of emphysema and pulmonary hæmorrhage. I have twelve examples of such an accident, and in six a fatal result ensued. In three cases, although the evidence of injury was very clear, and the hæmoptysis and emphysema by no means trivial, no bad symptoms showed themselves. The patients were kept at rest, support was given to the chest by strapping, and simple, unstimulating food administered; which treatment was rewarded by a rapid and perfect recovery. In three others the injury was very extensive, and severe inflammatory symptoms made their appearance; they were actively treated, in two by antimony, and in one by bleeding and antimony, with a good result. The following notes of one of the best examples will perhaps well illustrate the value of the practice.

CASE.—A boy, æt. 19, when riding on the shaft of a waggon laden with two tons' weight of leather, fell, and the wheels of the cart passed completely over his chest. Intense dyspnœa and hæmoptysis immediately ensued, followed by collapse; and in this condition he was brought to the hospital. On an examination, made as carefully as the case warranted, five or six of his left upper ribs were found to be fractured near their costal cartilages, and the sternal end of the left clavicle was thrown forward. Strips of adhesive plaster were applied round the thorax to preserve the ribs at rest, and the boy was placed in bed. When reaction had taken place, antimonial wine \zss , and opium $\mathfrak{m}\mathfrak{v}$, were given every three hours. The dyspnœa becoming worse, and suffocation from pulmonary congestion evidently threatening, I was called to see him, and suggested venesection. This was done to ten ounces, with immense and immediate relief, the boy gratefully

acknowledging it, and stating that he felt all right again. The pulse became smaller and more compressible, the respiration quieter, and the dyspnœa disappeared. The antimony was still continued. For some few hours all went on well, but at the expiration of that period the urgent symptoms returned, and twelve hours subsequent to the first bleeding were nearly as severe as ever. Under these circumstances the operation was repeated, and with the same result. Twelve ounces of blood were withdrawn in a full stream, the blood flowing until the symptoms were relieved. The breathing then became tranquil and quite soft, the boy being again left, with the antimonial treatment, comparatively comfortable. From this time all went on favorably, no return of the dyspnœa appeared, the cough gradually subsided, and the symptoms of returning health made their appearance, the boy leaving the hospital one month after admission, cured.

Remarks.—It is as difficult, if not impossible, in the description of a case, to give a correct impression of the symptoms in all their severity, as it is to render an accurate idea to its readers of the benefit of any treatment which was adopted. The case which I have just quoted, to my mind was a most admirable example of the benefit of bleeding and the antimonial treatment in injuries to the lung, and I wish that I could make as strong an impression upon my readers of the value of such a practice as the careful watching of this example made upon myself.

There was no doubt as to the extent of injury which had been inflicted; the passage of two tons' weight over a chest, followed by direct evidence of fracture of many ribs, copious hæmoptysis and collapse, were alone sufficient to indicate to the surgeon that some severe laceration of the lung had taken place. After the lapse of a few hours, that is, as soon as the collapsed condition had passed away and the circulation was restored, the marked dyspnœa and congestion of the veins, the rapid and hard pulse, together with other physical signs, too surely pointed to an excessive engorgement of the lungs, and that if relief was not afforded, absolute suffocation by the patient's own blood would speedily ensue. At such a crisis, antimony, however beneficial in simple cases, could not alone be trusted. There was no time for it to take effect

before the mechanical process of suffocation would have done its worst, and death must almost necessarily have followed.

Under such circumstances bleeding was performed, a free incision was made in the vein, and, as the blood flowed, life seemed gradually to return. The breathing, from being an act of labour, became quiet and subdued. The eye, from being deadened and congested, became bright and natural. The pulse, from being full and hard, became softer and less bounding; and the boy's feelings, equally valuable, from being impressed that death was nigh at hand, became more hopeful and resigned; and, as a spectator, I felt that such a hope was valid, and that success might crown our practice.

The relief which such a practice afforded at the onset was not to be despised when like symptoms returned; and the repetition of the bleeding was followed by a repetition of all its benefits. The antimony then came in to complete the cure; the blow had been struck by the double venesection; the pulmonary vessels had been relieved of their congestion, and the antimony had now succeeded in lowering the circulation, and had thus, by preventing such a repetition of the former threatening symptoms, perfected the cure.

These remarks, which I have been induced to make upon this case, and the practice which has been illustrated by it, have such a firm hold of my mind, from the careful watching of many similar instances to that just quoted, that I cannot recommend too strongly the general adoption of a like practice.

Bleeding, as an operation, is now one rarely performed; indeed, I believe that at *Guy's Hospital* it is rarer than any capital operation. In these cases of lacerated lung, however, when urgent dyspnoea makes its appearance, and the powers of the patient do not forbid it, I know of nothing which affords equal benefit, and which to the patient gives greater relief or to the practitioner greater pleasure. Bleed with no sparing hand; let the blood flow freely in a full stream, and as it flows the symptoms will gradually disappear. When relief has been obtained, immediately arrest the flow. Your aim has been to make an impression through the systemic circulation upon the pulmonary, and syncope can only do harm. Watch your patient carefully,

and repeat the operation if the symptoms should return, and, if necessary, repeat it a third time. I have never witnessed an instance where a third bleeding was ever required; at the same time it should be done if like symptoms make their appearance. The antimonial treatment, however, must not be neglected. The bleeding is really to relieve immediate symptoms, and to give time for the latter to take effect; when fully under its influence, the danger may be said to have disappeared, as few patients die from secondary inflammation of the lungs when once fairly under the influence of antimony.

I have no example to quote where such a result has taken place, and believe that, with judicious treatment, cases of fractured ribs and lacerated lungs, when not dying from the immediate result of the accident, seldom sink from secondary inflammation, if actively and boldly treated.

In the six fatal examples of such an injury, death followed at once or within a few hours of the accident; the laceration of the lung being so extensive that a fatal collapse ensued, and a speedy death; in such cases no hope can be entertained. But should reaction take place, and life be prolonged even for a short period, there is a hope, and the surgeon's aid is never more beneficially exemplified than when acting upon it with energy and decision.

SECTION 4.

On other cases of Injury to the Chest.

I will now proceed to quote an example of laceration of the lung, the result of an accident, but unassociated with any fracture of the ribs. As far as my experience goes, the case is a unique one, as I am unable to point out any work in which a similar instance is recorded.

CASE.—It took place in a boy, *æt.* 7 years, who, when playing in the road, was knocked down by the shaft of a cart; the wheel caught him by the left side of the lower part of his abdomen and turned him round, and stopped when just about to pass over the thorax.

Intense dyspnoea and severe hæmoptysis immediately resulted, and he was brought to Guy's. He was admitted

under the care of Mr. Birkett, and as I happened to be at the hospital I saw him. He was then in bed, lying on his right side, half turned over on to his abdomen, with his legs drawn up and flexed. There was intense dyspnoea and cough, accompanied with hæmoptysis. He was quite collapsed, and nearly unconscious; no indications of fractured ribs could be detected. He never rallied, dying two hours after the accident.

At the post-mortem the only external sign of injury was a bruise on the left side of the back. There was no fracture of the ribs, or any external indication of injury to the thorax. The right chest was filled with air and some ounces of blood, which evidently came from a laceration of the lower edge of the middle lobe of the right lung, about three inches long. The lung was partially collapsed. In the abdominal cavity were a few ounces of blood, from a laceration of the upper edge of the liver. There was also effused blood about the left kidney, from laceration of the supra-renal capsule.

Remarks.—This case is merely quoted to illustrate the fact that a laceration of the lung may take place independently of any fracture of the ribs. It is difficult to account for such an accident. As the patient was young, being only seven years of age, with ribs consequently more elastic, and the chest more capable of compression; it appears probable that the chest may have been so compressed, that the lung was dragged from its central attachment sufficiently to lacerate it. The interesting fact, however, remains, that there was no fracture, and yet a laceration—a point worthy of remembrance.

As a result of a severe contusion of the chest, mechanically interfering with the circulatory and respiratory functions, the following cases may be read with interest; the effects of the injury were directed upon the nervous system, congestion of the cerebral vessels evidently being the cause of the symptoms present.

CASE.—A man, æt. 23, an engineer, received a severe jam between the buffers of two engines on the anterior and posterior aspects of his chest. He was rendered completely

insensible, and bled profusely from the nose, blood also being extravasated into the eyelids and beneath the conjunctiva. In this condition he was admitted, about twenty minutes after the accident, with dilated pupils, and a slow, labouring pulse. In one hour he became conscious, and soon regained his natural manner; leaving the hospital well.

CASE.—The second case was in a healthy sawyer, æt. 26, who fell, when wrestling with a friend, with the whole weight of his antagonist upon his chest and abdomen. He was rendered by the accident completely insensible, and remained so about ten minutes, but when his consciousness returned he was totally unable to speak or to make any laryngeal sounds. On admission shortly afterwards, the skin of his head and neck were intensely congested, being of a bright colour. He was quite sensible, but dumb. Some fluid was administered, but it nearly choked him, evidently from paralysis of the muscles of deglutition as well as of the larynx. He was put to bed and rest was insisted upon; after eighteen hours' repose his speech suddenly returned and he could swallow with less difficulty; the congested appearance gradually disappearing. Two days, however, elapsed before his voice and powers of deglutition became as perfect as they were before the accident. The man left well.

Remarks.—There was little doubt by those who witnessed the condition of this man when first admitted, that intense congestion of the cerebral vessels was the most marked morbid condition which was present; the minute injection of the integument of the head and neck, with the vessels of the eye, rendering this fact apparent to the most casual examiner. The paralysis of the muscles of the larynx, associated with those of deglutition, indicated some affection of the pneumogastric nerves. The gradual disappearance of the congestion, and also subsidence of the paralytic symptoms, proved, that the mischief was but slight, and could be sufficiently accounted for by some temporary pressure; and it does not appear unfair to conclude that such symptoms were produced by the pressure of the venous blood returning from the head through the jugular vein upon the eighth pair of nerves, in some portion of its course, both passing through the foramen at the base

of the skull. The symptoms were those produced by local pressure, and as those symptoms disappeared when the pressure was removed and the natural circulation re-established, such an explanation appears to be the most probable. The case must be regarded as an interesting example of compression of the thorax, with its results, and being an uncommon one, is here quoted.

CHAPTER XII.

ON THE DISEASES AND INJURIES OF THE ORGANS OF CIRCULATION.

Independently of the dangers which immediately result from any injury to the circulatory organs, there is undoubtedly a natural dread of any accident or operation which may be accompanied with arterial hæmorrhage. It is impossible to calculate the influence which this fact has had, in bygone days, in retarding the progress of the surgical art; and even at the present time, very many members of the profession are still under its spell, and are apt to be unnerved and confused when this complication occurs in their practice. Nothing can better test the qualifications of a surgical practitioner than his conduct in such an emergency, and the scientific surgeon is at once recognised by his prompt decision and calm demeanour. His mind is not unsettled by the dangers and horrors of the scene; and his hand is alone rendered steady by the accuracy and certainty with which his acts may be directed. By vacillation many lives have been lost in the hour of extremity, and it is only by promptness of action that such an ending may be avoided.

We approach, then, the subject of this chapter already interested in the theme upon which it treats, and trust that the consideration of the material upon which our remarks will be based may not prove unfruitful, either in confirming such rules of practice as are generally advocated, or in leading our minds to know with certainty how to act in cases similar to those which have been brought before us.

On incised, punctured, and lacerated Wounds of Arteries.

The subject of wounds of arteries will first claim our attention, and a short analysis of the cases which have been admitted into Guy's Hospital during the last six or seven years will prove our starting-point.

I propose to analyse the materials before me in three divisions, dividing the cases into incised, punctured, and lacerated wounds.

Amongst the incised are eighteen cases of wounds of the radial artery, in some portion of its course; three of the ulnar; and two of the radial and ulnar combined.

There are five cases of wounds of the palmar arch; one of the temporal artery; one of the posterior tibial in the lower third of its course; and one of the anastomotica magna.

In the wounds of the radial and ulnar arteries; the application of a ligature to the divided ends was the practice adopted in twenty out of the twenty-three cases; in the remaining three a pad firmly fixed on the wound, pressure, and elevation, proved sufficient.

In two examples pressure was employed in the first instance, but a ligature had subsequently to be applied.

CASE.—One was in a man, æt. 34, who received an incised wound above the wrist, from some machinery. Severe bleeding took place at the time, which was arrested by the application of a pad and pressure. On the tenth day, while scrubbing a table, he felt something give way, accompanied with a sharp pain; copious hæmorrhage following, he came to Guy's. A double ligature was applied to the divided vessel, the lower ligature coming away on the third, and the upper on the sixth day; convalescence following.

CASE.—The second was in a man, æt. 59, who received a blow from a knife, which divided the radial and ulnar arteries above the wrist. Pressure was applied at the time, arresting bleeding, but on the seventh day secondary hæmorrhage occurred. A tourniquet was put on, and the man sent to the hospital, with the arm much swollen. All pressure was removed, and the patient was placed in bed, with the arm raised.

On the third day, or tenth after the accident, bleeding returned; the wound was then reopened, and the divided extremities of the radial and ulnar arteries secured; in a few days the man left well.

Remarks.—These cases are sufficient to indicate that the practice, which is too frequently followed, of arresting hæmorrhage from a divided radial or ulnar artery by means of pressure, should never be employed when a ligature can be applied.

In two other examples the same result followed a like practice; and although in some instances pressure alone may succeed, it is not by any means a satisfactory treatment, and a ligature should be preferred.

In the wounds of the palmar arch the application of the same rule holds good when it can be carried out; but there are serious obstacles to such a practice, rendering it necessary that the majority of cases should be treated by other means. I have but one example before me where the vessel could be taken up and secured by a ligature; in three others, a ball or block of wood was securely fastened in the palm, with the fingers and hand flexed, and the whole arm elevated; all turned out successfully, but every surgeon must feel that such a practice is only a poor substitute for a more definite and correct one. Where the wound is a punctured one, pressure should be employed, as the palm of the hand is not a favorable spot for incisions or for finding arteries.

CASE.—A boy, æt. 16, having fallen off a horse, received a punctured wound in the palm of his left hand from the corner of a hoe; severe hæmorrhage resulted, and surgical advice was sought. A tourniquet was applied over the brachial artery, and a pad over the wound; this was kept on for two days, the tourniquet being occasionally slackened: when it was removed, the bleeding returned very copiously. He then came to Guy's Hospital, with the arm much swollen from the pressure of the tourniquet, and the dressings saturated with blood; everything was taken away, water dressing applied to the wound in the hand, and the whole arm well raised. On the fifth day after admission, or seventh after the accident, some hæmorrhage took

place, which, however, was checked by elevating the arm; the day following, a slight return of bleeding making its appearance, a compress was applied over the wound, and the arm firmly fixed upon a splint. From this time everything progressed well, the wound healing, and the boy left cured.

Remarks.—This case is quoted as an illustration of the difficulties which a punctured wound of the palm may present to the surgeon, and also of the evils of a timid practice. The application of a tourniquet to the trunk of a divided vessel, although valuable when only applied for very temporary purposes, deserves the strongest censure when maintained for any lengthened period. In the example before us, the œdema and inflammation of the forearm were sufficient to show what might have been the result if the pressure, which had been kept on with but short intervals for two days, had not been removed; and in the case of a man who divided his radial artery over the dorsum of the thumb, in which a tourniquet was applied and kept on for days, I well remember gangrene and amputation being the result.

Such instances are now fortunately becoming more rare, the case last mentioned took place thirteen years ago, having at its close been admitted under the care of the late Mr. Aston Key.

There is every reason to believe that a good ball or firm pad, well applied on the wounded vessel, with the fingers and hand flexed, and arm well raised to a nearly vertical position, would have proved quite sufficient in the case just quoted as the basis of these remarks; and the bad effect, fortunately but temporary, of the pressure of a tourniquet, would not have been excited. The firm flexure of the forearm upon the arm in some cases will prove sufficient to arrest bleeding; and when it can be tolerated such a practice is a valuable adjuvant; but in several cases in which it has been attempted the patient has complained of so much pain as to render the position unbearable, and other means had to be adopted. Nevertheless it is a plan of treatment to be remembered, and applied when suitable.

The cases of wounds of the temporal artery, anastomotica magna, and posterior tibial, were treated by ligature.

The last case was in a man, aged eighteen, who received a wound behind the inner malleolus from an adze. Profuse hæmorrhage took place, and, when admitted, the posterior tibial artery was found to have been divided; a double ligature was applied, one to each end. On the twelfth day the silk came away, and cicatrization of the wound followed.

Amongst the cases of *punctured wounds of arteries* are two of the radial above the wrist; in both the artery was found to have been partially divided, and severe hæmorrhage resulted. A ligature was applied to the vessel above and below the wound, and recovery ensued.

Under the heading of punctured wounds of the femoral artery are three cases, all of which are worth recording.

CASE.—One was in a man, æt. 20, who received a stab, on November 23d, 1856, from a penknife, about the middle of the inner side of the right thigh. Some bleeding followed; but as the man immediately applied his finger to the orifice of the wound, it soon ceased, although he believed that he must have lost a pint of blood. The wound was then strapped up, and he kept his bed. On the 24th he got up and walked about for four hours. He called upon a surgeon, as he was in some pain, although the limb was not swollen, who recommended him to come to Guy's. On the 25th he remained all day in bed, as the thigh was painful and had begun to enlarge. On the 26th, or third day after the accident, he was admitted under the care of Mr. Cock. When examined, a small punctured wound was visible, situated about four inches below Poupart's ligament, over the Sartorius muscle; for about two inches round the wound the thigh was swollen, hard, and tense, but neither very tender to the touch nor pulsating; some pain existed, which was much increased upon moving the limb. The surface of the wound was dry, and free from any appearance of discharge. Rest was ordered to be enforced, and water dressing applied for three days; the pain gradually increased, and on the third day after admission, or sixth after the accident, there was a free discharge of a dark, sanious fluid, affording him instantaneous relief. On the tenth day, when using a bed-pan, profuse hæmorrhage took place from

the wound, evidently of an arterial character. A pad of lint and slight pressure, however, completely controlled it. The following day, being the eleventh, Mr. Cook determined to apply a ligature to the vessel, as there was no doubt as to the fact of its being wounded. Having divided the integument and fascia, and removed some large clots of blood which surrounded the artery, a small, vertical, punctured wound was at once seen; a ligature was applied above and below the wound, the leg was raised upon a pillow, wrapped in cotton wool, and the patient placed in bed. On the sixth day after the operation the upper ligature came away, and the lower on the eighth; some sloughing of the wound then appeared, which soon ceased on change of ward, and the man left the hospital cured.

CASE.—The second was in a boy, æt. 16, who, when employed cutting paper with a long amputating knife, allowed the point to jerk suddenly into his right groin, below Poupart's ligament. Profuse hæmorrhage immediately took place, followed by syncope. A tourniquet was applied, and the boy brought to Guy's Hospital. Admitted under the care of Mr. Birkett, on July 23d, 1858, a small, punctured wound was observed just below Poupart's ligament, over the course of the femoral artery. This was at once enlarged, and a ligature applied above and below an oblique wound in the vessel. No bad symptom appeared; on the fourteenth day the ligature came away, and a rapid convalescence followed.

Remarks.—The two cases which have just been briefly quoted are good examples of the symptoms which may be anticipated from a punctured wound of a large vessel, and are also useful in correctly illustrating the practice which should be adopted in like instances. In the second case, of the boy, where the wound was larger and the vessel more superficial, the immediate hæmorrhage was most severe, and if the accident had not taken place in the house of a medical man, who was well alive to the dangers of such a case and knew how to meet them, death would probably have at once ensued. Admitted within half an hour of the accident, there could have been no doubt as to the treatment which was required. To increase the wound in the integument, and ligature the

vessel above and below the seat of injury, was undoubtedly the line of treatment which was indicated, and the perfect success of the measure proved its wisdom. On the fourteenth day the ligature came away, followed by convalescence.

In the first case, the situation of the wound, and the immediate hæmorrhage following upon its infliction, would have led a surgeon at once to suspect that the femoral artery had been wounded; the immediate pressure applied through the patient's forethought, and the rest which was for the time preserved, were quite sufficient to allow the clot, which was necessarily formed around the vessel, to form a temporary plug, and thus prevent a return of bleeding; and perhaps if it had been wisely preserved, a cure might have taken place. The following day, however, the man got up, and it was not till after four hours' exercise that the clot previously formed had become disturbed, and the flow of blood allowed to recur. This second bleeding, accompanied with some pain, caused some alarm; surgical advice was sought, and he was recommended to come to Guy's. The bleeding, however, ceasing by itself, the pain not being very intense, and the local swelling but slight, he again believed that rest at home might prove sufficient; as the smallness of the wound, to the uneducated mind, could not be connected with anything like danger. For another day this rest was preserved, and no bleeding again appeared; but as the pain and swelling increased, he at last became alarmed, and was admitted into the hospital.

When admitted, there was no external indication of a wounded vessel. There was the evidence of a small puncture in the integuments, over the course of the femoral artery, but this puncture appeared cicatrizing; there was certainly some swelling from effusion beneath its seat; the vessels below were pulsating, but not at the seat of injury. The history of the case certainly indicated a wounded vessel, and it was believed that such was the real condition; however, it was thought advisable to see what nature would do, and to watch the case, keeping the leg well raised and in absolute repose.

For three days this treatment was carried out; the pain continued, and the swelling did not diminish; at the end of that period the wound again opened, and a quantity of decomposed and softened blood escaped; immediate relief was thus

given to the patient, the pain having been apparently caused by the tension excited by the effused blood; no hæmorrhage, however, followed. For another three days everything looked well; the pain had ceased, the discharge was lessening, and the general health was good. But it was clear that the wound in the vessel had not permanently closed, for the slight exertion produced by the use of the bed-pan proved sufficient to disturb the clot which had been formed, or rather to reopen the wound in the vessel made ten days previously, and a fresh hæmorrhage ensued.

Such an attack taking place under observation proved that nature alone in this case was not altogether capable of repairing the mischief which had been produced; surgical aid was imperatively demanded, and a double ligature was wisely applied, one above and a second below the punctured wound; no bad symptom following, a rapid cure ensued.

The wound in the vessel was observed to have been vertical, and this fact may in a measure explain the tendency to a natural cure, which evidently existed; and the doubt is still a natural one which suggests that a spontaneous cure might have resulted, if absolute repose from the first occurrence of the accident had been preserved.

That such cases do ever occur it is difficult to prove, as there is always room for doubt that the vessel had been really wounded. The following case, however, I believe to be an instance of such a recovery, and I will therefore briefly quote it.

CASE.—A boy, æt. 16, when quarrelling, received a punctured wound on the inner side of the middle of the thigh, from a chisel which was thrown at him; the injury was followed by profuse bleeding, which ceased when the boy became nearly faint. He returned home, and under medical advice kept at rest for two weeks; all appeared to go on well, no fresh hæmorrhage took place, and the wound was inclined to heal; there was some slight swelling, and the boy and his friends stated that "it beat." At this period, or fourteen days after the accident, a renewed hæmorrhage appeared, the blood being stated to have come out in jets; it again ceased by slight

pressure, and for another week did not reappear; it then returned with equal force and in a like manner, ceasing also by the same treatment. The pulsation of the blood-vessel was much dwelt upon. Three days passed without bleeding, but as the boy's friends became anxious, they brought him to Guy's, where he was admitted under the care of Mr. Hilton. The wound was then open and granulating; it was situated over the femoral artery, in the middle of its course; the pulsation of the vessel was very feeble, none being detected at the seat of injury, but the tibials below were patent.

It was not thought right to do more than watch the case and to insist upon perfect rest, the limb being raised. This treatment was all that was required; the wound gradually healed, and no bleeding or other symptom appeared, the boy leaving the hospital, after a stay of two weeks, well.

Remarks.—The situation of the wound, and the frequent hæmorrhages in this case, appear to me alone to almost justify the opinion, that the femoral artery must have received an injury; the frequent and unsolicited evidence of the friends, that the bleeding pumped out in jets, and that the swelling about the wound "beat," tended much to confirm such an opinion, and I am still disposed, although after the lapse of some time, to regard the case in the same light as I did when I first saw it. It is difficult, indeed it is impossible, to prove, that this opinion is correct, but by all the rules of probability it appears justifiable.

The subject of lacerated wounds of arteries now claims our attention, the analysis of the incised and punctured wounds having been briefly considered. I have three examples, one of the axillary and two of the popliteal, associated with and caused by dislocation of the knee-joint.

CASE.—The case of ruptured axillary artery was in a boy æt. 8 years, who, when climbing, fell upon the spike of an iron railing, the point entering the axilla and causing a lacerated wound; some slight bleeding took place at the time of the accident, but not to any great extent, and he was brought to the hospital. When admitted, there was seen to be a lacerated wound in the axilla, over the course of the vessel; there was no

bleeding, and there was also a total absence of pulsation in any of the vessels. A pad was applied over the wound, and the arm kept at rest; no bad symptom followed, and after five weeks he left the hospital cured, pulsation in the radial having returned, but none in the brachial artery.

Remarks.—It is fair to believe, in the above case, that the axillary artery had been so injured as to become obstructed; whether it was completely ruptured is another question; the accident was followed by a gush of blood, which ceased, never to return, indicating a laceration of a vessel; and as the brachial artery was subsequently quite occluded, and as there was no evidence of any effusion or other cause to press upon the vessel and thus close it, it does not appear unreasonable to believe that the vessel had been torn across and had retracted into its sheath; it is well known that a lacerated wound, dividing an artery, even a large one, may take place unaccompanied with any bleeding, and in this instance such appears to have been the case.

I have seen a femoral artery torn across, and no hæmorrhage beyond the first gush ever took place, and in military practice such a result is by no means uncommon. The causes for this are now well understood, and need, therefore, no illustration.

CASE.—The following example of ruptured popliteal artery was produced by a compound dislocation of the knee-joint; it occurred in a man, æt. 32, who was admitted under the care of Mr. Poland; the tibia and fibula were dislocated forwards, and the popliteal artery was evidently ruptured; some extravasation was present about the part, but not to any great extent, and all pulsation in the vessels had disappeared. The accident was said to have been produced by the passage of a cart-wheel over the thigh. Primary amputation was performed, but the man never rallied, dying sixteen hours after the accident. Upon examining the limb, a wound was visible on the inner side of the knee-joint, through which projected the inner condyle of the femur, a small piece of which was fractured. The tibia and fibula were easily moveable forwards, and the head of the fibula was dislocated from the tibia. The crucial ligaments were

entire. The popliteal artery was torn across in its centre, the ends being from one to one inch and a half apart. Both extremities being well plugged; there was not much effused blood present.

CASE.—The second case was in a man, æt. 30, also admitted under the care of Mr. Poland. He was a cabman, and, when drunk, was said to have received a kick from a horse in the popliteal space. When admitted, the symptoms of lacerated artery were well marked, all pulsation of the vessels had ceased, and extensive extravasation of blood existed in the seat of injury. The integument and fascia were at once divided, and a ligature applied to each end of the ruptured vessel; gangrene, however, rapidly followed, and thirty-six hours after the operation amputation was performed; the man, however, never rallied, sinking forty hours after the amputation.

Upon examining the limb, the cause of all the mischief was quite clear; the whole of the ligaments of the knee-joint had been ruptured, the tibia and fibula having been dislocated forwards, the condyles of the femur having evidently, by their projection into the popliteal space, ruptured the vessel. The bones could be moved about in any direction, and the divided ends of the vessel were at least one and a half inch apart.

Remarks.—The two cases just quoted are good examples of such a rare and severe accident as rupture of the popliteal artery; but as both were complicated with complete or partial dislocation of the knee-joint, the dangers of the cases were much magnified. Both occurred in young men, and in both amputation had to be performed; and although success was not permitted, the practice I believe to have been correct.

When the vessel alone is ruptured and no other injury coexists, the application of a ligature to the vessel is the practice usually advised. But when other serious mischief, such as joint implication, coexists, amputation should be selected. It may be a question how far the former practice is correct, as the result of such cases are not encouraging, still it is the one generally advised and acted on, and I am not disposed to recommend a contrary practice. I have two other cases before

me of injuries to arteries, one of the femoral, the result of a gunshot wound, treated by ligatures, and followed by gangrene, tetanus, and death; and a second, of frequent hæmorrhage from the peroneal artery, the result of sloughing after a contused wound, treated by ligature, and convalescence; but as they are only in a collateral manner associated with the subject under discussion, I shall make no further mention of them.

Wounds of arteries having been considered in the chapter which has been just completed, the following case of *secondary subcutaneous hæmorrhage* may perhaps be quoted as an appendix; such instances are very rare, and indeed the following is the only one which has ever passed under my observation, and for its rarity alone is worthy of record.

CASE.—A man, æt. 19, received a severe kick on the outer side of his left thigh; but little swelling appeared at the time, and he continued at his work as a carman. For two weeks he continued his occupation, feeling somewhat stiff in the part, and at times complaining of some pain; at this date, when walking, he felt something suddenly give way, accompanied with a sharp pain, and rapidly followed by excessive swelling; in this condition he was admitted under the care of Mr. Birkett. On examination, the whole of the outer side of the left thigh was much enlarged, tense, and painful; the fluid, for such it appeared, was evidently beneath the fasciæ, although the skin was much discoloured, probably from the original injury. Hot and cold lotions were applied for twenty-four hours; but after the lapse of such a period, as pain continued, the part was tapped, and a quantity of black fluid blood drawn off; relief was at once afforded by the operation, and after several weeks stay in the hospital, the remaining effusion was absorbed, and the man left well.

There can be little doubt as to the nature of this case; the sensation of something giving way, followed by the rapid effusion of what proved to be blood, indicated the changes which had taken place; some vessel must have been injured at the time of the accident, which had subsequently ruptured, and had, by pouring out its contents, caused the secondary enlargement of the injured part.

CHAPTER XIII.

ON ANEURISM.

Although the subject of aneurism has been always one of intense interest, and for the last few years has been rendered more prominent by the improvements which have taken place in its treatment; there is still vast room for greater strides before any very definite rules can be laid down, and before a surgeon can enter upon the treatment of a case with that absolute confidence which is so much to be desired.

The clinical consideration of such cases as the experience of a large hospital has furnished me, requires, then, no apology; as any material, if honestly given and correctly interpreted, must always be of use in furthering the great ends of all our practice—successful treatment. I have before me twenty examples of aneurism; and amongst these there is one of the right common carotid, and one of the innominate, in neither of which was it deemed desirable surgically to interfere.

In the former case the right pupil was permanently and firmly contracted; it was in an old soldier, aged fifty-seven, who had been the subject of rheumatism when in India, but who had otherwise enjoyed good health. He had accidentally discovered a pulsating tumour in the right neck fifteen months previously, and this had gradually enlarged; it was situated in the lower portion of the common carotid, and caused little or no pain; besides the local symptoms, the contraction of the right pupil was the only point of interest, probably from pressure on the sympathetic nerves.

There are fifteen instances of aneurism of the femoral artery in some portion of its course, two of these being in the upper portion, requiring the application of a ligature to the external iliac artery.

CASE.—The first was in a man, *æt.* 51, who had had rheumatic fever sixteen years previously; the disease had been discovered only three months, and was situated just below Poupart's ligament. The external iliac artery was tied by Mr. Hilton. The ligature came away on the thirtieth day, and convalescence followed.

CASE.—The second was one of aneurism of the profunda femoris, at its separation from the femoral. It was in a young baker, æt. 26, who had never had rheumatism, and had lived temperately. The tumour had been accidentally discovered, four weeks previously, by a sharp pain in the groin, shooting downwards. He continued, however, at his work, but as the pain increased, he came to Guy's Hospital. A tumour was at once detected in the upper third of the thigh, in the course of the femoral artery; the pain the man experienced was very severe, leading Mr. Cock, under whose care he was admitted, to propose an immediate operation. The external iliac artery was accordingly tied, with complete relief. On the sixteenth day the ligature came away, on the thirty-first the wound had nearly healed, and the man's health had much improved.

Upon the forty-seventh day after the operation, and thirty-first after the removal of the ligature, a gush of blood took place from the small fistulous wound, which remained open; pressure, however easily arrested it, and no return took place. He rallied, and went on well for two weeks, when he began to complain of feeling ill and of pain in his chest; slight hæmoptysis appeared, and death nine weeks after the operation.

Upon careful dissection, the aneurism was found to have been situated at the origin of the profunda femoris; it was large, and free from clot. The secondary hæmorrhage had probably taken place from the lower part of the vessel, through a common trunk of the obturator and epigastrie arteries (*vide* 'Path. Trans.,' vol. ix, p. 125). Death had evidently resulted from heart disease.

Remarks.—These two cases have been briefly quoted, as they are both of interest, the latter particularly so, from the profunda femoris being the seat of the disease. The application of a ligature to the external iliac was the only treatment which could have been employed, no room having been allowed for pressure above the aneurismal tumour. It is interesting to observe, that in the first case the ligature came away on the thirty-first and in the second on the sixteenth day.

The next two examples of aneurism were both in the left thigh, and were situated about Hunter's canal.

CASE.—One was in a man, æt. 30, who had by accident discovered the tumour three months previously; after a week's rest in bed, pressure was applied by means of the alternate application of a lead weight and serew tourniquet; so much pain and irritation, however, resulted from their application, that the treatment was abandoned, and a ligature applied to the vessel above the sac. On the tenth day the ligature came away; slight oozing of blood having taken place twenty-four hours previously; and convalescence followed.

CASE.—The second was in a man, æt. 38, who, a month prior to his admission, after experiencing pains in the leg, which he described as rheumatic, discovered an aneurism above Hunter's canal. Pressure was applied to the vessel in the groin, in the same way as in the previous case, and on the sixteenth day pulsation had ceased; in three weeks the tumour was quite hard and solid, and the man left cured.

Remarks.—The two examples just quoted were alike in all respects. Both were young men, in both the aneurism was of short duration, and about the same size, and in both it might have been expected that the same treatment would have resulted in a like end. In one, however, pressure proved quite intolerable, and had to be given up; in the second, a more fortunate result ensued. The reasons for this difference are at present not to be explained, but such differences are so frequent in practice, that few surgeons can expect that one definite line of practice will always succeed in all cases; rules, it is true, may be laid down; but they cannot always be carried out; our practice having to accommodate itself to the wants of each individual case. In the examples just quoted, although pressure failed to produce any beneficial influence, it did no harm; and as it might fairly have been expected to succeed, as in Case 2, the surgeon would not have been justified in at once resorting to the severer measure of operation before he had proved that the more simple one had failed.

Under the heading of popliteal aneurism are 11 cases, 10 in men, and one in a woman; 5 were in the left, 5 in the right leg, and one in both.

Their respective ages were—25, 27, 28, 31, 32, 36, 36, 37, 42, 56, 70, the majority being in early adult life.

Three of the cases were cured by pressure; five by ligature after pressure had failed. Two died from internal arterial disease when under treatment by pressure; and one died after amputation, from gangrene following the application of a ligature for a burst and diffused popliteal aneurism.

CASE.—In the case of a man, *æt.* 25, pressure had been applied seven months without any positive result; the application, however, of a pad and bandage over the sac itself, associated with the application of the clamp, in the end succeeded.

CASE.—A woman also, *æt.* 37, was treated by the clamp and weight for five weeks without any apparent advantage; a series of students then kindly undertook to keep up pressure with their fingers, and after sixty hours all pulsation ceased, and a recovery ensued.

CASE.—In the third case, of a man, *æt.* 27, pulsation ceased after the application of pressure for two weeks, and the tumour contracted and consolidated; but when he left, the vessel was still pervious, as pulsation existed in the vessels below, although there was none in the tumour.

Such a result was, however, most satisfactory; the aneurism, as such, had evidently consolidated, and was thus cured. The vessel was probably patent, as the arteries below freely pulsed. No return has up to the present been heard of, and a cure may confidently be asserted to have taken place.

Remarks.—The three cases just briefly quoted are good examples of the successful treatment by pressure, and also of the difficulties which are met with in practice. In one case (the first) a cure could not be obtained until the tumour itself was firmly bandaged, and the circulation through it thus retarded; in the second, manual pressure speedily succeeded although that produced by the use of instruments had entirely failed; in the third, a successful result followed the pressure by the tourniquet, although it was most probable that the vessel was still pervious, as indicated by the pulsation of the vessels below the tumour.

The five cases successfully treated by ligature, after pressure had failed, were as follows.

CASE.—One was in a man, æt. 32, admitted under my care in June, 1858, who had observed the tumour for five months. Pressure was applied, and carefully watched for some days, when the tumour had become firm and had apparently consolidated; the treatment was continued, as a precaution, for a few hours extra, when all the symptoms returned. The tumour became soft and pulsating, and, in spite of treatment, gradually enlarged; flexure of the leg upon the thigh, and thigh upon the pelvis was then employed, but after this position had been preserved for a few hours the pain became so intense as to be intolerable. The vessel was at length tied. On the twenty-fifth day the silk came away, and a recovery ensued.

Remarks.—In this case pressure at first appeared to have done all that could have been desired; the tumour rapidly consolidated and diminished in size. The students who had charge of the case, in their anxiety to preserve perfect pressure, I fear, manipulated the tumour too much in their examinations to detect whether they completely commanded the vessel; the fibrin, I believe, by these manipulations became disturbed, and and its subsequent deposition was not permitted.

The perfect arrest of the circulation through the tumour by the double flexure of the leg and thigh was very marked, and led me to anticipate a most successful result. The intolerable pain which soon, however, appeared, put an end to all such hopes, and such treatment had to be abolished. A ligature fortunately subsequently succeeded, and a cure ensued.

The case is a valuable one in a practical point of view; it demonstrates to a great degree the value of pressure as a means of cure, for the tumour had nearly become consolidated, and it was only as a precautionary measure that the pressure was ordered to be kept up for a few extra hours; it proves, too truly, the evil results of anything like manipulations of the tumour when under treatment by pressure, as I could never divest my mind of the idea that it was by these manipulations that the treatment had proved abortive. It showed well that the double flexion of the leg and thigh had the complete

power of arresting the circulation through the vessel, and therefore give undoubted hopes (which recent experience has realised) that in other cases such a treatment might prove of value; and lastly, it proves that even when all these measures have failed, a recovery by ligature may fairly be anticipated, and that the delay, and interference of the surgeon, had by no means any deleterious influence on the ultimate result.

CASE.—The second case was in a man, *æt.* 36, admitted under the care of Mr. Birkett. He was an Irishman, and somewhat troublesome to manage. He had felt an aneurism for six weeks, preceded by pain for six months; it was large, soft, and protruded much on either side of the popliteal space.

Pressure was applied, but, from the man's stupidity, it could not be kept up without intermissions; and as the tumour was evidently enlarging, a ligature was applied; on the ninth day it came away, and recovery took place.

CASE.—The third example was in a man, *æt.* 36, also under the care of Mr. Birkett; he had discovered the swelling only three weeks, and had never had any pains or rheumatism. Pressure was applied for four weeks, with apparent benefit, when the tumour suddenly enlarged, and had, without doubt, given way. A ligature was at once applied; on the ninth day it came away, and convalescence ensued. A few weeks subsequently, on his complaining of pain in the opposite ham, a second aneurism was discovered. It was not deemed desirable to attempt the treatment by pressure, particularly as the man requested the application of a ligature. Accordingly the operation was performed. Upon the twenty-second day the ligature came away, and a cure resulted.

The interest of this case is the rupture of the aneurism whilst under treatment, and the double nature of the affection. Other comments upon it are unnecessary.

CASE.—The fourth case was of a man, *æt.* 42, admitted under the care of Mr. Birkett, with an aneurism in the right popliteal space; he was a labourer, and had enjoyed good health. The disease had been discovered only six weeks; the tumour

was very large, and somewhat firm. Pressure was applied after the man had been kept at rest for a few days, and maintained for one week, but without benefit; and as the aneurism showed a disposition to enlarge, and the irritation of the tourniquet, &c., became intolerable, a ligature was applied. Everything went on well; on the twenty-first day the ligature came away, and convalescence followed.

CASE.—The fifth case is still under treatment by Mr. Poland; it occurred in a man, æt. 31, who had been the subject of rheumatism for years. The tumour was in the right leg, and had been discovered only two months. Pressure was applied, as usual, and preserved for three days, when the integument inflamed, and caused so much pain, &c., that the vessel was tied. On the fifteenth day some secondary hæmorrhage took place, and was repeated on the seventeenth, when the wound was opened, and both ends of the vessel tied. On the twenty-second day the ligatures came away. The case is still under treatment.

Upon the whole, the analysis of the cases of popliteal aneurism treated by pressure is a tolerably satisfactory one. It is true that but three out of eight cases in which success might have been expected by such treatment have been recorded; in the remaining five the application of a ligature had subsequently to be resorted to; but in neither of these instances was there the slightest evidence to show that the pressure had done any harm; the cases went on well after the ligature had been applied, and no bad symptoms interfered with convalescence. If, then, no harm or evil result can be shown to have taken place from the simple practice of pressure; and as success in a certain number of cases may be expected; the propriety of attempting a cure by such means before resorting to a ligature cannot be doubted. At the same time the success of ligaturing an artery is very great, and it is hardly right for the surgeon to waste too long a period in his attempts to obtain a cure by pressure, when such a favorable line of practice as the application of a ligature can be carried out. But there is another argument in favour of pressure which cannot be overlooked, and that is, the beneficial tendency which it exerts in encouraging and establishing the collateral circulation in the limb; its influence

in this direction doubtless is very great, and should accordingly be weighed in the balance when a comparison is being made between the two forms of practice.

I should, then, suggest that in all cases of popliteal aneurism, unless any decided symptoms are present contra-indicating the treatment, pressure should be primarily resorted to; invariably carrying out the rule that the patient should preserve absolute rest, in the horizontal position, with the limb raised, for a few days previously. Let a few weeks, say a month, be expended on such a practice, and if good hopes are not held out or realised in that period, let a ligature be applied. Looking at the thing personally, the above is the line of practice I should select if I were the subject of aneurismal disease; and as such an argument is always of value, I should consequently recommend the same.

As to the period of time at which a ligature separates from the diseased vessel, no rule can be laid down; it will be seen, from the following analysis, to be very variable. In the cases before me, the time was, from the external iliac, thirty and sixteen days respectively; from the femoral, nine, nine, ten, twenty, twenty-one, twenty-two, and twenty-five days. Nine days is the earliest period, and thirty the latest; a very wide difference; fairly proving that no general rule can be laid down when the separation of the ligature may be expected.

CASE.—The first of the two cases proving fatal when under treatment was in an old man, *æt.* 70, in whose left popliteal region was an aneurism, the size of an egg, of a year's duration. Pressure was applied, but after a few hours, local gangrene appearing, it was discontinued. On the second day a fatal syncope destroyed life. After death the right ventricle was found gorged with blood and thin, the left contracted and empty; fibroid degeneration was present in the heart's structure, and the valves were covered with chalky deposits. The aorta was very healthy, the smaller vessels being diseased, the femoral remarkably so. The aneurism was very thin, and contained a soft clot. The vessels of the brain were also much diseased.

CASE.—The second was in a man, *æt.* 56, who had de-

tected an aneurism in his left leg for six months; he had been in a metropolitan hospital under treatment by pressure for six weeks without benefit; for one week he had been at home, resting the limb. When admitted, the whole leg was swollen and œdematous; the tumour was the size of a fist, and pulsated but very slightly. The leg was placed on a pillow, and rest enforced; on the second day the œdema of the limb had much subsided, and all pulsation had ceased; he complained, however, of some pain in his chest. On the seventh day the aneurism was but half its size, was quite solid, and the leg was natural. He appeared to be in good health, making no complaints, but in a few weeks he suddenly died. After death a large aneurism was detected at the origin of the descending aorta, which had burst and had thus caused death. The popliteal aneurism was about the size of a goose's egg; it was formed by a pouch from the anterior surface of the artery, the lower portion of the vessel passing over it when looked at from behind. Two-thirds of it was filled with fibrin, the remaining third with fluid blood, so that the cure was only progressing. The vessels were extensively diseased throughout the body.

The example of death from amputation for gangrene of the leg, following the application of a ligature to the femoral artery for a burst and diffused popliteal aneurism, took place six years ago, and deserves a short abstract in this place.

CASE.—It occurred in a farm-labourer, æt. 25, who three months previously discovered a pulsating tumour in his right popliteal space; his attention having been drawn to the spot by a pain shooting down the leg. He continued, however, at his work for one month, when he sought advice. He was directed to apply a poultice to the part, and as this gave no relief a puncture was made into it with a lancet; nothing, however, then escaped; but the following day, severe hæmorrhage coming on, he was sent up to Guy's with a tourniquet on the femoral artery. When admitted, under the care of Mr. T. Callaway, the whole of the popliteal region and leg were swollen from extravasated blood, and as the history of the case correctly revealed its true nature, a ligature was at once applied to the femoral artery; gangrene, however,

rapidly followed the operation, and on the twelfth day amputation was performed, and twelve days subsequently the man died exhausted.

On examining the limb after its amputation, an enormous, diffused aneurism was made out; the whole tissues of the leg and thigh were infiltrated with blood, and it appeared probable that this extravasation, by its pressure, had arrested the venous circulation of the limb, and had thus assisted the rapid development of gangrene.

Remarks.—The case is an instructive one in many ways; the error which his first adviser had committed in not recognising the nature of the case was a very grave one, although good men have fallen into it before, and the practice based upon this mistake was equally to be blamed. Carelessness must have been the fault, and not ignorance, for the symptoms, as told by the man, were so palpable, and most clearly indicated the true nature of the disease. To any student who may peruse these notes let the moral be deduced, that a correct treatment can only be based upon a correct diagnosis, and that if the latter is obscure, let greater caution be observed in carrying out any treatment which may suggest itself. To plunge a lancet into an aneurismal tumour is indeed a great error; the thought of such an accident excites a thrill of horror, and the fact that it has occurred should be a warning to the careless.

That gangrene should have followed the rupture of the aneurism and the application of a ligature to the diseased vessel is a point of interest, especially when associated with the cases previously related of rupture of the popliteal vessel; and leads one almost to doubt the wisdom of the practice which suggests the propriety of ligaturing the vessel in such cases, and to question whether an amputation is not the better practice. It is a point worthy of consideration, but not one to enter into in this place.

CASE.—One of the three examples of aneurism of the vessels of the forearm, was of the radial in the upper portion of its course, just where given off from the brachial artery. It was in an old woman, æt. 62, who had worked hard, and had six months previously, when wringing clothes, felt some-

thing give way at the part; the tumour soon appeared, and gradually increased to the size of a walnut. A pad and pressure were applied on the part, with the forearm flexed, for three weeks, but without benefit; the patient then left, on account of some family reasons, to return for operation; but in this we have been disappointed.

The two other cases were aneurisms of the radial and ulnar arteries after a punctured wound, treated by pressure.

CASE.—One was in a man, *æt.* 19, who, six weeks previously, had received a punctured wound from a splinter of iron in the lower third of the radial artery; the accident was followed by a jet of blood, which was checked by a compress and bandage. The wound healed readily, but a pulsating tumour rapidly appeared, which steadily increased. When in the hospital the aneurism suddenly gave way; the sac was consequently laid open, and the vessel tied above and below the punctured wound. On the sixth day the ligature came away, and a cure resulted, the radial artery pulsating when he left the hospital.

CASE. — The second was in a man, *æt.* 19, who, nine weeks previously, had received a punctured wound from a pipe over the right ulnar, below the wrist. Hæmorrhage came on, which was arrested by pressure; and when the wound had healed, one month prior to his admission, a pulsating tumour appeared, which gradually increased to the size of a walnut. The sac was laid bare by Mr. Poland, and the vessel ligatured above and below; the pulsation, however, was not commanded, in consequence of a third vessel supplying the sac from beneath, which could not be reached. The radial was then ligatured, as pressure upon it arrested pulsation, and a steady cure resulted.

Such cases as these, point out the error of treating the wounds of vessels by pressure alone. In the wounded superficial ulnar and radial arteries, it is not a difficult operation to apply a ligature, and it is certainly the safest; when, therefore, it can be done, it should not be deferred.

CHAPTER XIV.

ON NÆVUS.

The interest connected with the subject of nævus is of a double character; the disease being, as a rule, congenital, there has always been a strong inclination, both on the part of the public and professional mind, to assign the development of such growths to the mental or emotional conditions of the maternal parent; and the theories thus framed by the superstitious portions of our nature have not been flattering to man's intellect. It is not my object to follow out this portion of the subject; it will suffice for me to give it as an opinion, that positive evidence is wanting to prove that there exists any connection between mental emotions on the part of the mother; and the development of growths described as nævi.

The pathology of this disease is another subject of great interest, and at present it is wrapped in some obscurity. That it is a disease of the capillary system there can be no doubt; that in some cases the arterial, and in others the venous system, has a predominating influence is also tolerably certain; and that the growth itself is allied to the natural erectile tissues appears equally probable; nevertheless, the exact anatomy of these nævi is not yet sufficiently intelligible, and it would well repay the investigation of any careful pathologist.

It is interesting pathologically to witness the growth and degeneration of these structures. A nævus, from being perhaps at first scarcely visible, may grow with variable degrees of rapidity to enormous dimensions; it may commence entirely in the skin, and, not involving the cellular tissue beneath, may begin and end as a purely cutaneous nævus; the ordinary port-wine nævi, and others of a like character, are, as a rule, of this description.

Others may originate in the cellular tissue beneath the integument, and if their development is not great, they may never involve the skin or other tissues, but may begin and end as the subcutaneous nævus. These may be known by

their peculiar feel; they will be soft and spongy, yet more or less fibrous and elastic. When the child cries, dilatation may be visible, and to the eye and to the fingers such an expansion may be perceptible; a few large veins may generally be observed beneath the integument, and by these signs it is not difficult to diagnose the disease under consideration.

There is a third or mixed variety, composed of the two former ones combined—that is, the *nævus* is both cutaneous and subcutaneous; originating, as a rule, in the subcutaneous tissue, and gradually involving the integument itself.

The distinction between these three classes of *nævi* is practically of great value, as the treatment must be modified according to each form.

In the purely cutaneous *nævus* alone are caustics of any value. Nitric acid, or potassa fusa, carefully and freely applied, in such cases are often sufficient to obtain a cure; but if the *nævus* involves the deeper subcutaneous tissues, it cannot be expected that any benefit will accrue from their application. The acid or caustic acts only upon the part to which it is applied, and as it can only be applied to the surface, it is only upon that that any influence can be exerted. As a consequence, it should be remembered, even in such a simple case as *nævus*, that a correct practice can only be based upon a correct diagnosis, and that if the diagnosis of this purely cutaneous *nævus* is mistaken, the practice based upon it is sure to fail.

In the simple and uncomplicated subcutaneous *nævus* the application of external remedies are palpably inexpedient; and it is in these that the value of the subcutaneous ligature, or of the injection of the perchloride of iron, is often most admirably illustrated. The former I regard as the most certain and most rapid method of cure; the treatment by injection is always uncertain, and not to be relied upon, although in exceptional instances it acts very favorably. It is a practice which I now rarely adopt, as I find that other treatment is more certain in its effects and more rapid.

When a subcutaneous *nævus* can be isolated, the subcutaneous ligature should be selected; and when this isolation cannot be carried out, the treatment by seton is

most valuable. A few threads passed through different portions of the growth, and left in for a few days (that is, sufficiently long to excite adhesive inflammation), will generally prove sufficient to destroy the *nævus*; the effused fibrin, by its subsequent contraction, strangulating the minute vessels, and thus allowing the degeneration of the vascular growth.

If one application of many setons fails to effect a cure, a second should be attempted, and a third or fourth should not prove discouraging. Perseverance will generally be followed by success; but a repetition of their application should not be carried out until the immediate effects of the former have passed away.

In the mixed or third variety of *nævus*, that is, where both the skin and subcutaneous tissue are involved, the application of ligatures to the whole, or excision, where it can be carried out, is the best treatment.

The form of ligature should be adapted to the size and situation of the *nævus*; it may be tied in one, two, three, or more portions; pins may be used, or otherwise, according to the fancy of the operator or necessities of the case; the object to be attained is thoroughly and completely to strangle the growth, and if this is done it is immaterial as to the means—efficiency is the only test.

When the *nævus* can be isolated, as in those forms which are completely pendulous, excision is the simplest and most efficient remedy; the base may be fixed by a clamp, and on its central side ligatures may be passed so as to include the whole of the base of the tumour; on its distal side excision may be performed. One clean incision being made along the side of the metallic clamp, the actual cautery may then be used to prevent all chance of hæmorrhage if any portion of the divided *nævus* should have been left, and the clamp may then be removed; the ligatures, as previously applied, will maintain the edges of the wound together, and a lineal cicatrix will alone remain. This practice has proved successful in many instances, and when it can be repeated it should be carried out.

In cases in which, from their position, or from their diffused nature, neither form of practice as just indicated can be

employed, the treatment by seton is most valuable. It is a practice which of late years has fallen somewhat into disrepute; why I know not, but from considerable experience in such a practice I can most conscientiously advise its reintroduction.

It must not, however, be forgotten that these *nævi* have a natural tendency to degenerate and to undergo a cure; their rapidity of development and situation should alone lead us to adopt any surgical treatment. If situated in any portion of the body where disfigurement is of no consequence, and the *nævus* shows no disposition to enlarge, it may with safety be left alone, for it is tolerably certain that as years advance it will degenerate and become a simple and harmless tumour.

The form of degeneration which they generally take on is very interesting; the vessels apparently contract and, at any rate, cease to grow; the cells of the erectile tissue, instead of being filled with blood, become closed, and, by the outpouring of a serous fluid, cysts are formed. This cystic form of degeneration is the only one with which I am acquainted, and it appears to be most characteristic of the *nævoid* structures.

The appearance of these degenerate tumours is very peculiar. In the purely subcutaneous form which has taken on this action, an incision into it will show fibre-tissue, and the dense bands will be divided by numbers of cysts, varying from the size of millet-seeds to marbles, or even larger; these may contain simple serum, or the serum may be stained with blood; in some cases the secretion will be more inspissated; fat may also be deposited within the meshes of the fibre-tissue, but this is accidental. The general appearances of the tumour are very characteristic, although it is not sufficiently recognised.

In the cutaneous and mixed form of *nævus* which has undergone degeneration, the difference in its position will of course cause some difference in its structure. The subcutaneous portion will present appearances like those which I have already described. The cutaneous will be modified by the anatomical peculiarity of the integument; externally, a peculiar, warty tissue will present itself; if manipulated, how-

ever, these warty-looking growths will have a spongy and elastic feel, and if these are punctured, blood or serum will escape; if serum, a cyst developed in the cutis or true skin will have been opened; if blood escapes, the degeneration is going on, but is not perfected. The capillaries are not closed, and, as a consequence, blood flows through them into the cellular interspaces, and thus escapes. Nevertheless, the pathology is the same in both, the anatomical peculiarity of the part in which the growth has been developed being sufficient to explain the difference.

This subject is a tempting one to enlarge upon, but as my object is not to enter into pathological subjects, except in so far as such investigations are necessary to render the purely practical more intelligible and rational, I must forbear.

Amongst my notes of cases admitted into the hospital since September, 1853, I have forty-five examples. Amongst the out-door practice such cases are very numerous, but it is my wish to confine my statistics to such cases alone as were admitted.

There is only one case of the purely cutaneous nævus, which was developed on the forehead, and was covered with hair; it was destroyed by nitric acid, but when the child left there were indications of its return.

There are eighteen examples treated by the application of a ligature, and these were all of the mixed variety, the ligature including the integument and cellular tissue, with nævus growth beneath. Sixteen of them were in children less than two years of age. Two were in girls sixteen and twenty-four years of age, in whom the growth was increasing.

In one case only was the purely subcutaneous ligature employed, but it was followed by success.

In twelve cases of the subcutaneous or mixed varieties, the treatment by injection was carried out, the perchloride of iron having been used in all. In seven a successful result ensued, the nævus becoming indurated, and apparently in an inactive condition. In one case suppuration followed, but a cure appeared probable when the child left. And in four instances the whole tumour sloughed off, the inflammation excited by the injection having been too intense, and sloughing followed.

In five examples of pendulous nævi, excision was successfully performed by means of the clamp, ligature, and excision, as previously described; in each a linear cicatrix alone remained, and the impression left upon the surgeon's mind by the observation of these cases is so favorable, that a similar line of treatment, when practicable, cannot be too highly recommended.

In six cases the degenerate nævus has been excised. In three the degeneration was complete, the patients being four, twenty-five, and eighty years of age. In three, aged respectively twelve, thirty, and fifty-two, it was incomplete, but success resulted.

And in five cases no treatment was deemed advisable. On the whole, however, a successful prognosis may generally be given. In my own practice, based more particularly upon the out-patients, the treatment by setons has been extensively employed, and with most uniform success; indeed, in the cases which I have previously pointed out, I can most confidently recommend the practice as worthy of adoption; it is suitable to many cases where other treatment would be employed, and still more so where none other is even applicable.

Table of the Injuries and Diseases of the Nose, Larynx, Thorax, with its contents, and of the Organs of Circulation, admitted into Guy's Hospital from October 1st, 1853, to June 30th, 1860.

	Cured.	Relieved.	Died.	Total.
Polypus nasi .....	...	22	...	22
Pharyngeal polypi	1	5	...	6
Malformed septum .....	...	1	...	1
Chronic inflammation of the Schneiderian membrane .....	...	1	...	1
Ozæna .....	...	3	...	3
Foreign bodies in larynx.....	4	...	4	8
Œdema of glottis from boiling water	7	...	5	12
Diseased larynx .....	...	6	1	7
Superficial wounds of throat	21	...	1	22
Deep wounds of throat	7	...	7	14
Fractured ribs, simple	106	...	2	108
Fractured ribs and injury to lungs.....	21	...	6	27
Lacerated lung .....	...	...	1	1
Compression of thorax	5	...	...	5
Immersion	7	...	4	11
Wounds of chest	2	...	3	5
Wounds of arteries	37	...	2	39
Subcutaneous secondary hæmorrhage	1	...	...	1
Aneurism, cervical .....	...	2	...	2
Aneurism, femoral	11	...	4	15
Aneurism, humeral	2	1	...	3
Nævi.....	43	5	...	48
Wounds of veins	2	...	3	5
Ruptured varicose veins	5	...	...	5
Dry gangrene and gelatio	7	...	4	11
Epistaxis	12	...	...	12
Hæmorrhage from gums.....	6	...	...	6
Local phlebitis	24	...	...	24
Thrombus	8	...	...	8
	339	46	47	432

CLINICAL SURGERY.

THE SURGERY

OF THE

MOUTH, PHARYNX, ABDOMEN

AND

RECTUM,

INCLUDING HERNIA.

BY

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MDCCCLXI.

THE SURGERY

OF THE

MOUTH, PHARYNX, ABDOMEN, AND RECTUM, INCLUDING HERNIA.

THE clinical surgery of the nervous, respiratory, and circulatory systems having been considered in the previous chapters; it is my intention in the present briefly to review the surgery of the mouth, pharynx, abdomen, and rectum; basing my remarks upon, and illustrating the subjects to be discussed from, the materials which the last seven years and a half's experience at Guy's Hospital has furnished me. Acting on the principle which was adopted in the former chapters, I shall be as brief as possible, confining myself as much as may be consistent with clearness to the practical.

The surgery of the mouth will first claim our attention, the subject of hæmiplegia having the prior consideration.

Table of the Injuries and Diseases of the Mouth, Pharynx, Abdomen, and Rectum, admitted into Guy's Hospital from October 1st, 1853, to March 30th, 1861.

Diseases.	Cured or relieved.	Died.	Total.
Harelip	46	1	47
Cancer of lip	52	2	54
Affections of the tongue	27	3	30
Affections of the palate, tonsils, and pharynx	44	—	44
Stricture of the œsophagus	14	2	16
Contusions of the abdomen	53	1	54
Ruptured viscera	4	13	17
Strangulated hernia—			
Inguinal	108	26	134
Femoral	103	47	150
Umbilical	13	5	18
Anal abscess and fistula.....	236	—	236
Hæmorrhoids.....	61	—	61
Stricture of rectum	45	3	48
Other affections of rectum	31	—	31
Total	837	103	940

CHAPTER XV.

ON HARELIP.

The deformity included in this term is one of general interest; it being congenital, the causes which may have tended to its production have at all times been regarded as fit subjects for speculation, and the fact that surgical science can, in the majority of cases, do much to remedy the defect has by no means tended to diminish its importance.

I possess notes of forty-seven cases, simple and complicated.

- 21 of these were of a simple character;
- 3 were complicated with a fissured gum;
- 2 " " " hard palate;
- 17 " " " " and soft palate; and
- 4 were double in their nature.

In only half of the cases tabulated, therefore, was the deformity quite simple, fissure of the hard and soft palate in at least 50 per cent. being associated with it.

Its position.—It has been the habit with most surgical writers to repeat the observation which has been handed down to us, that this deformity is the most frequent on the left side of the body; my own materials, as far as they go, certainly bear out the truth of this opinion, for, omitting seven instances in which the side was not mentioned, in thirteen cases, or 36 per cent., the fissure was on the right side, and in twenty-three cases, or in 63 per cent., it was on the left, the left being its most frequent seat by 27 per cent.

Sex.—Respecting the sex in which harelip is the most common, it has often been asserted that boys have the advantage; the materials before me certainly bear out this opinion, for, taking the forty-seven cases as a whole, in thirty cases it occurred in boys and in seventeen in girls.

If we analyse the cases, however, more carefully, a somewhat curious result makes its appearance. In the simple cases of harelip the number is equally divided, that is, of the twenty-one cases, ten were in boys and eleven in girls.

But in the cases which are more complicated a different result becomes apparent. Of the five cases of fissured gum or hard palate, three were in boys and two in girls; but out of the seventeen instances of harelip associated with fissure of both palates, thirteen were in boys and four in girls; the four examples of double harelip were also in boys, the male element being far in excess. These facts may be merely accidental, and a larger number of cases may, perhaps, prove their fallacy; I give them, however, as they stand, to be confirmed or corrected by future observations.

Treatment.—In the whole of the cases tabulated, with three exceptions, an operation was performed, and in only one of these did a fatal result ensue.

CASE.—The fatal case was in a boy aged eleven days, in whom the palate was so completely cleft as to prevent suckling. When admitted, the child was extremely emaciated from want of nourishment. The operation, as performed by Mr. Forster, was unattended with the loss of much blood; the child, however,

never showed symptoms of rallying, and died four days subsequently.

In three cases the parts subsequently separated after operation; in one, aged five weeks, however, when the edges showed a granulating surface, they were re-adapted by means of strapping, and a good cure resulted. In the second, aged four weeks, the operation was repeated with success, the sutures in the first operation having given way in a fit of crying. And in the third case, aged five months, a second operation was postponed till the child's health had improved.

In the remaining forty cases a good result was obtained.

The next point for observation is the ages at which the operation was performed, and the relative success at each.

- 3 cases were operated on within the first two weeks, and two of them on the eleventh day, one of which proved fatal.
- 7 „ were four and five weeks old, in two of which the parts subsequently gave way, although the cases in the end turned out well.
- 6 „ were operated on between the sixth and eleventh week with success.
- 10 „ were treated between the third and sixth month, with only one failure; and
- 5 „ between the sixth and twelfth month, with a good result.
- 13 „ were also successfully operated on after the first year.

From the consideration of the above it would appear that during the first six weeks of life the operation is by no means so successful as to warrant operative interference, unless an absolute necessity compels.

Out of ten cases one died, and in two the parts sloughed, although subsequently the mischief was repaired.

At later dates the operation, on the whole, may be regarded as a tolerably safe one.

About the third month appears to be the most favorable period, the vital powers of the child having by that time, as a rule, become established, and able to resist the slight tax upon their strength as occasioned by the operation.

At an earlier date the operation should be condemned, unless the very existence of the child should be exposed to danger by the want of power to obtain its natural food.

Treatment.—In simple harelip the ordinary operation of

paring the edges of the fissure may be all that is required, having attended to what appears to be the most essential point in all such operations—*a free section of the mucous membrane of the lip from its inner gingival attachment*. The use of fine pins in certain cases may be admissible, but, as a rule, the simple suture, firmly applied, will be sufficient.

If the intermaxillary bones should project too far, they should be removed, unless firm pressure upon them can improve their position, and all tension of the lips must be prevented by free division of the mucous membrane. A plan, I believe suggested by Malgaigne, has, in my hands, in half a dozen instances been most successful; by it the labial notch has been done away with, and the deformity most completely remedied; it consists simply in paring the edges of the wound from above downwards, leaving the inverted flap adherent at its labial border. Having thus brought the divided lips together above, the lower flaps may be connected by a fine suture, and if these are found to be too long, their extremities may be curtailed, the remaining pieces being left to fill in the gap which is otherwise invariably left after the ordinary operation.

This plan I most strongly recommend for general adoption; it gives all that is required by the operation, and demands only a little nicety in the adjustment.

In the treatment of these cases the surgeon should remember that if the primary attempt fails—that is, if primary union cannot be procured—there is still a good hope of recovery from secondary adhesion. When the whole edges of the wound are granulating they should be brought together again by strapping, or even by sutures, and a good recovery may ensue. In a case related such a result was most successfully obtained, and I have had two cases under my own care in which the same success was ultimately secured.

CHAPTER XVI.

ON CANCER OF THE LIP.

Under the above heading are included all cases of cancer and epithelioma or cancrroid of the lip. The latter form of the disease is by far the most frequent, although there is no doubt that a genuine carcinoma of the lip may be occasionally met with in practice.

It is not necessary in this place to enter into the pathological differences between the two forms of disease. Both are malignant or cancerous in the usual signification of the term, the elementary cell-structure of the epithelioma having more the characters of the tissue in which it is developed than the genuine carcinoma. Epithelioma grows also less rapidly, is not so frequently associated with secondary granular depositions, and is also less liable to return after its removal.

I possess the notes of fifty-four examples of the disease, and I shall now proceed to record such facts as a careful analysis of the cases may yield.

Position of the disease.—Why it is that this affection should more frequently involve the lower lip than the upper is a point which has never been explained; the opinion that it is caused by the friction of a pipe in smoking cannot surely be seriously entertained, as both lips are equally involved in such a practice, and cases are not unfrequent in which the habit of smoking has never existed. That the fact, however, is a true one cannot be doubted, for out of my notes of the fifty-four cases, fifty-two are of the lower and only two of the upper lip, or 3·7 per cent. The lower lip is, perhaps, the most exposed, and is certainly more liable to fissure than the upper, and when cracked there is always a great tendency on the part of the patient to keep the part open by picking or biting the excoriated surface. In patients, therefore, possessing a tendency to cancerous disease, this spot may be thus rendered liable to take on such an action. There must be some definite cause for such a selection, and the simple explanation I have given does not appear to be improbable.

Cases of cancer of the upper lip.—One of the cases mentioned was in an old man aged seventy-one, and the tumour had been growing five years; it was excised, and convalescence followed.

The second was in a man aged sixty. The disease had been growing only four months, and had involved the gum and hard palate. No treatment was applicable, and the man left.

Sex.—A second point, equally unintelligible with the last, now presents itself, and that is the undisputed fact that this disease, as a rule, attacks only the male sex. Out of my fifty-four cases, however, I can quote three instances as having taken place in women, or 5·5 per cent.

Cases of cancer of the lip in women.—These were respectively fifty-eight, forty-five, and forty-six years of age. In the two former the disease had existed only a few months; in one excision was performed with success; in the second the disease had extended to the chin, and relief was afforded by the application of a caustic. In the last case the disease had existed for four years, having appeared directly after a blow upon the spot; excision was performed, and convalescence followed.

Age at which the disease first made its appearance.—In order to arrive at a definite opinion upon this point I have tabulated the materials before me, and the following facts have to be recorded:

In 3 cases the patients were between 20 and 30 years of age.

7	"	"	"	30	40	"
12	"	"	"	40	50	"
19	"	"	"	50	60	"
10	"	"	"	60	70	"
2	"	"	"	70	80	"
1	"	"	"	80	90	"

The youngest patient was a sweep aged twenty-seven, and the oldest also a sweep aged eighty-six, in whom the disease had existed but one month. In about 40 per cent. of the examples the disease appeared between fifty and sixty, and in about 80 per cent. between the ages of forty and seventy.

The duration of the disease.—

In 19 instances it had existed only a few months.

13	"	"	about 2 years.
4	"	"	" 3 "
3	"	"	" 4 "
2	"	"	" 5 "
4	"	"	" 6 "
1	"	"	" 8 "
1	"	"	" 10 "
2	"	"	" 12 "
4	"	"	the period was not stated.

From the above it would appear, therefore, that in the majority of cases the disease had existed from a few months to about two years, about 60 per cent. of the cases seeking advice at this period; in about 20 per cent. the disease had existed from two to five years, and in the remaining 20 per cent. from five to twelve years.

Return of the disease after removal.—From my fifty-four cases out of which this point has to be eliminated; eight instances (or 14·8 per cent.) have to be recorded in which advice was sought on account of a return of the disease after removal. In forty-six examples, or 85 per cent., no surgical treatment had been previously required. The history of the former cases are briefly as follows:

CASE 1.—A man, *æt.* 60, one year previously to his admission had a cancer removed of six months' growth; the disease returned within a month. Excision was again employed with success.

CASE 2.—A man, *æt.* 63, was admitted with disease of the lower lip, of too great an extent to allow of an operation; it had existed six years. It was removed for the first time three years previously; it returned in nine months, and was again excised; he remained well for six months, when a return took place, which gradually spread; no operative relief was considered justifiable.

CASE 3.—A man, *æt.* 70, was admitted with cancer of the lip of ten years' growth; it was excised. Three months subsequently a return took place, and a second operation was performed after six months with success.

CASE 4.—A man, æt. 60, was admitted with cancer of the lip of ten years' duration; it had been removed nine years previously, after which he was well for two years, when it reappeared, and a second operation was performed. He remained well for three years, when its reappearance was again treated by excision. For the interval of four years he had no return, but six weeks before admission a reappearance was observed; it was again excised for the fourth time, but the wound never healed; caustics were subsequently applied with partial success, and the man left the hospital five months after.

Remarks.—It is interesting to remark in this case the gradually increasing interval between the return of the disease and each operation, it being consecutively one, two, three, and four years.

CASE 5.—A man, æt. 39, had his lip removed for a tumour of two years' growth. The wound never healed, and was again excised six months subsequently, with a good result.

CASE 6.—A man, æt. 44, was admitted with extensive cancerous disease of the lower lip and chin of five months' duration, his lip having been removed six months previously. Palliative treatment was alone employed.

CASE 7.—A man, æt. 49, appeared with a cancer of the lip of six months' growth. He had been operated on three years previously for the same disease, the tumour having then existed six months. It was excised with perfect success.

CASE 8.—A man, æt. 71, was admitted with a cancer of the lower lip of three months' growth, and with a second independent tumour at the angle of the mouth of three years' existence. On his tongue there was also a cicatrix caused by the removal of a similar tumour some months previously by caustic. A ligature was applied to the cancer at the angle of the mouth with complete success, and subsequently the one on the lip was excised. This wound, however, never completely healed, and although the man left the hospital, he returned four months after with a cancerous tumour in the same spot; it

was again removed, and he left well. Six years have passed, and no history of the man can be obtained.

Remarks.—This case is interesting from the fact of the multiplicity of growths. When admitted there were two independent tumours at different parts of the lip, and the fact that a like disease had involved the tongue was a point of extreme interest. This is the only instance of a multiple cancer of the lip I have ever seen.

Occupation.—In only twenty-seven out of the fifty-four examples of this disease has the occupation of the patient been registered. Two of these were sweeps, the remainder having followed various occupations, none of which are generally regarded as tending to the development of epithelioma.

Smoking as a cause.—In nine cases the sufferers had never indulged in this habit, in the remaining forty-five examples it had been freely or moderately followed. The former fact tends much to militate against the idea that smoking is the chief cause of this disease, 16·6 per cent. never having smoked.

Treatment.—In the majority of the cases the simple operation of excision was performed; in several very superficial examples the surface was excised, and the wound allowed to granulate; in a larger proportion of cases the tumour was removed by the ordinary V incision; and in a few other instances the operation was so modified as to bring up a new lip from the integument of the chin. This latter operation requires some ingenuity and skill, the object being to bring up from below the jaw sufficient integument to fill in the gap caused by the operation. It may be done by prolonging the ends of the V incision downwards, and thus allowing the lateral flaps to slip up, having freely detached them from their connexion with the bone; or when the whole lip has been excised, by making a horizontal incision beneath the skin, and having freed the parts also from their osseous connexion, fixing them as a new chin by strapping or other means; the incision below will generally readily granulate. There is no object in postponing any operation when the disease has positively made its appearance; the operation is, at the first appearance of the tumour, a very simple one, and, as a rule, is

followed by a good result; from Case 4 already quoted it would appear that the reappearance of the growth is considerably retarded by repeated operations, and in a large number of instances it is probable that no return takes place. We should therefore, with confidence, recommend our patients to submit early to operative relief, with the feeling that it is undoubtedly the best treatment to be adopted.

Fatal cases.—I possess but two cases of this disease in which a fatal termination took place; one was accidental, a man, aged sixty, having been destroyed by pyæmia, having been admitted for an extensive cancerous ulceration of the lip of six years' duration. The second was in a man aged fifty, who had had his lip removed one year previous to his admission for a genuine epithelioma of five years' growth. Immediately after the operation the glands beneath the jaw enlarged, and gradually increasing to a large extent, he sank from repeated hæmorrhages and profuse discharge, with symptoms of some internal depositions. No post-mortem was, unfortunately, allowed. This secondary glandular enlargement is a point of considerable interest, some authors denying that such a complication ever exists with epithelial cancer. This case is quoted to refute the absolute correctness of that opinion, although there can be no doubt that secondary glandular enlargements are less common with epithelioma or cancrioid growths than with what is called genuine carcinoma. In several of the cases quoted of returned tumours the glands also were enlarged.

CHAPTER XVII.

ON DISEASES OF THE TONGUE.

The surgical injuries and diseases of the tongue are replete with interest; the importance of the organ to the comfort and well-doing of the individual, together with the fact that the slightest injury or affection of its substance is associated with much personal inconvenience, ensures the early application of the sufferer for professional assistance.

Wounds.—The tongue, like other parts, may be the seat of wounds. The commonest is caused by the teeth, produced either during an epileptic attack or by a fall with the tongue protruded. I possess the notes of one instance in a man, aged thirty-four, who fell from a scaffold with his tongue out; an extensive transverse wound in its left half was the result, unaccompanied with much hæmorrhage. Sutures were applied, and a good recovery ensued.

Remarks.—This case indicates the correct treatment to be applied in like injuries, and the result which may, as a rule, be anticipated. Wounds of the tongue should always be at once treated by the application of sutures passed through the thickness of the organ and some few lines from its divided edge, and under such circumstances a perfect cure may be procured.

CASE.—Some six years ago I saw a child, æt. 9, who had received an extensive wound of the tongue from a fall six months previously. The case had been neglected, and no surgical treatment had been employed; as a consequence, the right half of the tongue was nearly separated about its centre, and it was with difficulty that the child could speak or masticate. I pared the edges of the wound and applied sutures, a good recovery taking place.

Inflammation of the tongue.

Apthous inflammation of the tongue.—The ordinary apthous inflammation of the tongue is by no means uncommon; it may be found in children or in adults, and appears to be caused by any irritation in the alimentary canal; it is easily subdued by means of the chlorate of potash, given internally in five-grain doses, and a lotion of the same salt, of about one to two drachms to the pint of water.

Simple ulcer.—Occasionally the tongue is the seat of a simple ulcer, and this is perhaps the form which is described by authors as the dyspeptic ulcer; it is certainly, as a rule, associated with some disturbance of the digestive apparatus, and, as a consequence, may be correctly designated by such a

term. I have the notes of an obstinate case which came before me last year, which is worth quoting.

CASE.—It was in a delicate-looking, but otherwise healthy, banker's clerk, æt. 20, who had been the subject of a superficial ulceration of the tongue for *thirteen months*. He had never had syphilis, and his living had been good and steady. He had sought all kinds of advice, had taken mercury, and the ulcers had been irritated by the nitrate of silver and other applications, but all without benefit. When I saw him the tongue was extensively ulcerated over the anterior portion and its under side; it was superficial and indolent in its character. I gave him the chlorate of potash as a medicine and as a lotion, and ordered him to live on the simplest diet; under this simple treatment he recovered perfectly in three weeks.

About six months subsequently he had a slight return, but it was subdued as rapidly by the same treatment.

Remarks.—This case is given to show how a simple disease may be mistaken for a more serious one; and how, by such an error, the patient may be kept in misery and subjected to every form of treatment that can be applied. Having recognised the fact of its simple nature, simple treatment will suffice, and the time usually required for its cure is not great.

Acute inflammation of the tongue.—This affection is a very serious one; as an idiopathic affection it is occasionally met with, and it may be produced as the result of the application of some irritant.

CASE.—A case occurred in my own practice of a man, æt. 37, who for one week prior to his application had experienced pain in the right half of his tongue, accompanied with difficulty in deglutition. He felt as if the tongue was too large for his mouth, and when I saw him it was partially projecting; the right half, and that alone, was involved, and felt spongy to the touch. There was little constitutional disturbance. I prescribed a purgative and saline medicine; a week subsequently the swelling had partially subsided, and, as a consequence, he could take nourishment more easily. On the

fourteenth day it was still swollen and was localized, an abscess evidently existing in its substance; this I opened, and a teaspoonful of thick pus escaped. From this time he rapidly recovered.

CASE.—The second case was in a patient of Mr. Cock's; a child, æt. 14, who, ten days before admission, pricked her finger with a weed, which caused her so much pain that she sucked it violently. Her tongue rapidly became swollen and inflamed, and six days afterwards an abscess broke. When admitted the tongue was swollen, and in its right side an opening existed, discharging pus; a simple lotion of the Sodæ Chlorinatæ was prescribed, and convalescence rapidly followed.

Remarks.—In both the cases above quoted suppuration followed, and I have no case to give in which a different result has to be recorded. Such a termination, however, is not generally described as being a common one; the swelling, as a rule, subsiding, and leaving no traces behind.¹ When the œdema is very intense, threatening suffocation, incisions should be freely made into the tongue's substance, and simple constitutional treatment is all that is required. The cases, as a rule, do well, if rightly treated.

Hypertrophy of the tongue is a disease which too often defies all medical treatment; whether it is ever the result of an inflammatory action is a question on which my experience will not allow me to express an opinion. Authors, however, state that such may be the case.

CASE.—I have the notes of a case which has been periodically admitted into Guy's Hospital, and was originally under the care of the late Dr. Addison. It occurred in a boy, æt. 6, who from birth had been the subject of an enlargement of the tongue. When admitted that organ was protruding from the mouth. After a month's treatment he left relieved. He reappeared three years subsequently, and came under the care of

¹ Since writing the above another case of suppuration of the tongue has taken place, in a boy, aged sixteen, who was admitted under my care with stone in the bladder. A few days after admission he was attacked with purpura, and subsequently by pyæmia, suppuration of the tongue appearing as a symptom. He rapidly died. On examination, the tongue was found infiltrated with purulent matter.

Mr. Hilton, who prescribed the bichloride of mercury in small doses with some advantage. He has been admitted several times since, and by the same means procured temporary benefit. The disease does not certainly progress, and it is hoped that it may, as time advances, become less.

Tonics, good living, and fresh air appear to be the most important points of treatment to be attended to. If inflammatory action has any influence in its development, the bichloride of mercury may be administered; and in one case which fell into my hands, the iodide of potassium had a rapid and marked beneficial tendency.

Tumours and deep-seated ulcerations of the tongue.

I have deemed it right to class these two different conditions under one heading, as it most frequently happens that the deep-seated ulcerations of the tongue are the immediate result of some softening down or degeneration of a previously existing tumour. This may be of a syphilitic or cancerous nature; its degeneration may ensue at a subsequent period, leaving a specific or cancerous ulcer.

That *syphilitic tumours* are formed in the tongue, as they may be in other parts, is a point which can hardly now admit of a doubt. They appear to be composed of little else than ill-organized inflammatory products, this material having been effused into or between the muscles of the part. Sometimes the tumour thus formed will be of a diffused character, at others it will be more localized and will give the surgeon the idea of a distinct growth; both forms, however, have the same pathology, and both may be completely removed by appropriate treatment.

Like the inflammatory syphilitic exudations in other parts, and more particularly like those which are so frequent in the cellular tissue, degeneration is a common termination; an abscess, as a result, takes place, leaving an excavated and ragged ulcer.

A *cancerous tumour* may pass through all the same stages; a local or infiltrating tumour may first appear, and grow to any size with variable degrees of rapidity; at some uncertain period its degeneration will certainly ensue, and softening, with the

formation of an abscess, will be the result. Having discharged its contents, an ulcer will be left, which is generally described as being cancerous ; its deeply excavated and irregular surface, indurated, ragged, and everted edges, are points which, to the practised eye, at once suggest its true nature.

It is hardly necessary to dwell on the importance of making a correct diagnosis in these two forms of disease, for the syphilitic is amenable to medical treatment, whilst the cancerous can only be relieved by some surgical means.

I have notes of several very interesting examples of syphilitic tumours, the following abstract of which may be read with interest.

CASE.—A married woman, æt. 37, applied to me in September, 1857, with a large, ill-defined tumour developed in the extensor muscles of the right thigh ; it had been growing six months, but somewhat slowly. It caused little or no pain. She had had an ulcerated tongue some months previously, but from this she had recovered. Her husband had also been under my care with a specific eruption, which had been cured by iodine.

The iodide of potassium and iron were given to the patient, and in six weeks the tumour had entirely disappeared.

CASE.—A married woman, æt. 36, applied to me for advice with a large tumour developed in the muscles of the left scapula, beneath the spine ; it was diffused, and completely occupied the whole of the surface of the bone. It was firm to the touch, and at times painful ; it had been growing about nine months. No history of syphilis could at first be obtained, but it appeared that one year previously she had suckled a neighbour's child, and had suffered from sore nipples of an obstinate character, an eruption of the skin, which was cured by treatment, having also subsequently appeared.

Under the bichloride of mercury and tonics the whole of this tumour disappeared in three months, and convalescence was established.

The cases of cancer of the tongue are more numerous. I have 18 examples, 13 in males and 5 in females. In the

majority of instances the disease had existed but a few months :

1	patient	was	24	years	of	age.
3	were	between	30	and	40	
4	„		40		50	
6	„		50		60	
3	„		60		70	
1	aged	77.				

Treatment.—In the largest proportion of cases nothing but palliative treatment could be applied ; the disease was too extensive and diffused to allow of any surgical operation, and consequently relief was given by means of lotions to the part to keep the wound clean. The biborate of soda and the Sodæ Chlorinatæ are the best forms, combined or not with some preparation of opium. Tonics should be administered to improve the health, and good living advocated. In four cases the operation of excision was performed, and in two of these a subsequent return rapidly took place. In these examples the disease was quite local, existing only as a distinct tubercle, and excision was carried out without difficulty ; in one case some copious hæmorrhage followed, which was, however, speedily arrested by the actual cautery. In two or three other examples of the disease, relief was for a time obtained by the application of a caustic or the hot iron ; but such remedies are, as a rule, by no means satisfactory ; they may do good, but it is for a very short period, and they should be employed only when the local disease is very painful ; in these cases the destruction of a portion of the growth by such means appears to be beneficial.

On sublingual cysts.

To describe these cases as examples of ranula, and consequently as of obstructions to the sublingual or submaxillary gland-ducts, would be clearly incorrect ; the pathology of this affection is now too well understood to allow of the perpetration of such an error ; and all who doubt the correctness of this opinion I must refer to a paper of Mr. Birkett's, in the ' Guy's Reports,' for 1859, in which this subject is fully discussed.

Examples of this affection, unless of a very aggravated form,

are not often admitted into a hospital; they are numerous, and are treated with good success amongst the out-patients.

That they are merely the result of obstruction to some of the mucous glands situated beneath the tongue is a point which appears to be tolerably certain; and that the ducts and glands of Rivini are the seats of the disease appears to be highly probable.

I have the notes of but four examples from the in-door experience of Guy's, none being of marked interest; but from my private note-book, taken from the out-patients, I have several, of which the following are brief notes.

CASE.—One case was in a man, *æt.* 19, who for six months had observed a swelling beneath his tongue, which appeared to be situated about its centre; this had grown gradually, and had at last become so large as almost to prevent his speaking. When I saw him, the tongue was pressed upwards to the roof of the mouth by a large cyst, projecting equally on both sides of the *frænum*; it was of the characteristic bluish colour, and was very tense. The salivary ducts were clearly seen to be passing over it, and uninvolved.

A free incision was made into the cyst, and an ounce and a half of the tenacious albuminous fluid drawn off, when a second cyst became visible, apparently contained within the walls of the first; this was likewise freely opened, and an ounce of the same fluid escaped; the cysts were both plugged with lint, inflammation followed, and an apparent cure resulted.

CASE.—I have the notes of another case, somewhat similar, which took place in a man, *æt.* 22, who, for two months, had observed a swelling beneath the tongue; when I saw him, it was very large, and the salivary ducts were uninvolved. I freely opened the cyst, and, having done so, a second became visible, situated by its side, both being included in one wall. This was subjected to a like treatment; both were plugged, and convalescence followed.

Remarks.—In these two cases it was evident that a double cyst existed, one having apparently pressed into its neighbour, and become included in the same wall. A double obstruction

to the ducts of the mucous glands must have here taken place; and the cases are quoted to assist in pointing out the pathology of the affection, and to show that it had nothing whatever to do with the salivary glands.

Another case deserves to be quoted from its excessive rarity, and, with the exception of a second, which is recorded in the Museum Catalogue of Guy's, I know of no other.

CASE.—A man, æt. 25, applied to me at Guy's, on June 10th, 1861, with an inflamed tumour beneath his tongue. It appeared that he had first observed a swelling in this part six years ago; a seton was passed through it at that time, but the tumour never disappeared. It caused him no inconvenience, however, till six months previously, when it began to enlarge; and as it became so inconvenient from its size, he sought advice. On June 1st, he applied to a surgeon, who lanced it and pressed out some hard matter. The whole tumour then inflamed and became frightfully offensive, which made him seek my advice. When I saw him, he could scarcely speak, the tongue was pressed upwards to the roof of the mouth by an inflamed tumour situated beneath it, which completely filled in the hollow of the lower jaw, and pressed backwards; an opening was also observed in its left side, into which a probe could easily be passed. Pressure being applied to the mass, a peculiar granular, cheesy, semi-solid material came out, smelling dreadfully. I increased this opening which already existed, and squeezed out about three ounces of this decomposed animal substance. The cyst-wall became then very visible; it was smooth, glistening, and inflamed. The man was ordered to cleanse his mouth frequently with warm water.

On June 17th, his next visit to me, he was comparatively comfortable; the cyst had been completely emptied, and the inflammation had subsided, pus coming from the interior of the cyst. The ducts, also, of the salivary glands became very visible, and passed over the tumour, not being involved. Convalescence gradually followed.

Remarks.—This case is quoted as a singular illustration of the disease. It was evident that the salivary glands had nothing to do with the formation of the tumour, as the ducts were uninvolved and were discharging freely their natural

secretion. It is probable that the secretion which had become so offensive was nothing more than the altered secretion of the cyst, which had existed for so long a period; it was certainly not of the nature of a calculous, being far too abundant.

Treatment.—The treatment of these cysts is not complicated; the aim of the surgeon is to destroy the cyst-wall, and thus prevent the re-accumulation of the secretion after its evacuation. A moderately free opening into the cyst, and a free plugging of the cavity, to excite inflammation of its walls, is generally successful, and is the simplest treatment. A seton at times does good, and injecting them with iodine has been also advocated; excision also has been recommended. This latter operation is not so simple, and, indeed, it seldom succeeds. The first plan is the one which has been most successful in my hands, and I therefore recommend it for adoption.

CHAPTER XVIII.

ON AFFECTIONS OF THE TONSILS, PALATE, AND PHARYNX.

Tonsillitis.

It is by no means an uncommon thing for surgeons to be consulted for certain diseases of the tonsil gland. Chronic inflammatory enlargement is the most frequent form, although occasionally cases of acute disease may come before his notice. When a tonsil is inflamed it is exceptional for any suppuration to take place, this result being found only, as a rule, in cachectic and ill-fed subjects. When it exists, an early opening is most desirable, as the operation not only relieves the patient, but prevents the possibility of any sudden rupture of the abscess into the larynx, and consequently sudden death. Such a case came before my notice in a child about two years of age, death taking place instantaneously from suffocation.

In the early stage of inflammation of the tonsil, even when acute, the gum guaiacum appears to possess a most marked beneficial influence; I generally prescribe it in the ordinary form of the *Mixtura Guaiaci* of the *Pharmacopœia*. In less acute cases, tonics, such as quinine and iron, are generally indicated; the inhalation of steam, medicated or otherwise by poppies, affording comfort and relief.

I possess the notes of fifteen examples of tonsillitis treated on these principles within the hospital, with a good result; and will now pass on briefly to consider the chronic enlargement of the gland, such as at times requires surgical relief.

Chronic enlargement of the tonsils.

My notes yield me twenty instances as having taken place in Guy's, the majority of such cases being treated amongst the out-patients. In all of these excision was performed, either of one or of both glands. The guillotine is the instrument generally selected, and answers admirably, although instances occasionally are seen in which the growth is too large to allow of the adaptation of the ring; when this is the case, the bistoury is accordingly employed. The operation is not one of difficulty, care being only taken not to point the instrument outwards, and thus run the risk of wounding the vessels of the neck. In none of the cases which I possess did any evil result follow the operation; the hæmorrhage is not, as a rule, very copious, and may readily be controlled by iced water used as a gargle: if troublesome, the application of powdered alum or any other styptic may succeed; but such a result is rarely met with.

In none of the instances before me are there any points worthy of a remark. One case, however, was of so severe a nature as entirely to prevent the patient's deglutition of solids; the child, aged three years and a half, having lived for six months upon liquid food. The respiration was also much impeded, being of a wheezing nature. The tonsils were very large, and met together. They were both removed by the bistoury, with immediate relief, and a good recovery ensued.

Affections of the pharynx and palate.

It is not my intention to describe every form of affection of these parts; but my purpose is simply to illustrate such conditions as may have passed under my own observation, and to quote cases when they can be obtained from the practice of Guy's Hospital.

The first subject which offers itself for observation is that of *wounds*. The situation of the palate and pharynx is not so exposed as to render them very liable to injury, nevertheless in practice we meet occasionally with cases, and the wound is almost always produced by a fall or blow upon some sharp instrument, as a pipe or stick situated in the mouth.

CASE.—I have the notes of a case of lacerated wound of the soft palate, occurring in a child, æt. 3, who fell with her mouth open on to a stick. The soft palate was lacerated from before backwards through its free margin. The dresser, very wisely, at once adapted the edges by means of sutures, and a rapid recovery took place.

Remarks.—The practice pointed out by the above example is the correct one to be followed in like instances. All these injuries should be treated by the same means, the sutures being applied at some distance from the edges of the wound. It is worthy of remark that in these cases recovery, as a rule, may be expected by simple sutures; division of the muscles of the palate, as performed in the operation of staphyloraphy, is not required, simple apposition of the parts being all that is necessary.

Growths from the palate at rare intervals come under observation; the simple fibro-cellular polypus may be developed there, as well as from other parts of the mucous membrane. I have seen two instances, and both were from the free margin. Proliferated warty growths also may make their appearance. A case occurred of this description at Guy's, in the practice of Mr. Birkett; it was in a young man aged twenty-seven, and the growth had been observed six months, springing from the hard palate. A ligature was applied to its base, and the warts

were then cut off by scissors; a cure resulted. Another instance of growth, also from the soft palate, has to be recorded; it took place in the practice of the same surgeon, and was of a peculiar nature.

CASE.—It was in a man of a remarkably healthy aspect, æt. 34, who had discovered it only two weeks before his application at Guy's Hospital. The growth was of a villous character, each villous being of a semi-transparent nature, not unlike the ordinary gelatiniform polypus; it was excised, and nitric acid was subsequently freely applied to its base. The growth, however, gradually returned in spite of the constant application of the acid, and at last it became as bad as ever. The glands of the neck also became enlarged and grew rapidly, destroying the man within one year of the first appearance of the tumour. A post-mortem could not, unfortunately, be obtained.

Remarks.—This case was one of great interest; every observer regarded the primary growth as one of a simple character, the elements being only those of all fibro-cellular tumours. Its rapid reappearance and the subsequent secondary glandular infiltration pointed to its malignant nature, and, if these points ending in the destruction of the patient are to be regarded as characterising malignant disease, the case just quoted must be placed in such a category; nevertheless its general appearance and microscopical elements were certainly unlike those seen in cancer, and it is probably one of the intermediate kinds of growth which go to form the chain, one end of which is the simplest tissue which appears in man, and the other the most malignant.

Perforating ulcers of the palate claim a passing notice, being in their treatment obstinate and unsatisfactory; they are generally, if not always, seen in the median line, and, as a rule, at the junction of the hard and soft palate; it would appear that the greatest amount of tension exists at this spot, and consequently, when ulcerative action appears, it proceeds more rapidly; the tendency of the muscles to separate the parts causing a perforation to be left. Such a perforation is not an unfre-

quent result of ulcerative action, and the surgeon is consequently consulted to remedy the evil.

If the ulceration is still going on, little can be done in a surgical point of view. Medicines should be given to relieve the constitutional conditions, which are, as a rule, present. If syphilis or so-called struma is the suspected or palpable cause, medicines must be administered which are well known to have a beneficial influence in such affections. Iodide of potassium, iodide of iron, cod-liver oil, quinine, or iron are the favorite remedies, the two former combined being the best in syphilis.

Locally, stimulants may be applied to promote cicatrization, by which process, if the perforation is small, a cure may be obtained. If not, some operation may be called for. That of paring the edges and applying sutures may in some cases prove beneficial, although it has never fallen to my lot to witness a single successful example. The application of lunar caustic to obtain contraction by cicatrization may also be employed, and in several instances I have observed marked benefit to ensue from its use. In large perforations the former method appears most applicable, and should be attempted; in the smaller, the latter should be first employed. Constitutional treatment, however, must not be neglected, but all means employed to maintain and to restore the powers of the patient.

Inflammation of the pharynx.

The pharynx, like other parts, may inflame and become the seat of suppuration; this result, however, is not by any means a common one, and I can quote from my notes but one example, as having taken place in a man aged fifty-seven: it had been coming on three months; the abscess was opened, and recovery took place. When abscess exists there is always too much reason to fear that it depends upon some deep-seated cause, such as disease of the intervertebral substance or of the vertebra. I have seen an abscess in the upper part of the pharynx, the result of extensive disease of the cervical vertebrae, followed by recovery; and other cases have passed under observation in which the same result has taken place from a like cause, and in which a subsequent post-mortem examination has revealed its true nature.

CASE.—A child, æt. 3, was admitted in the year 1855, nearly asphyxiated. The history was that the child, in apparent health, was eating its dinner, when it suddenly became choked. Admitted ten minutes after the first appearance of the symptoms; a probang was passed with ease down the œsophagus, but without relief; a digital examination having previously told Mr. Callaway, the surgeon, that no obstruction existed higher up. Tracheotomy was at once performed, as it was believed that some foreign body had passed down the trachea, but without any good result, the child rapidly dying.

After death the nature of the disease was clearly revealed; a large spinal abscess existed, extending from the third to the tenth dorsal vertebra, pressing upon the œsophagus opposite the sixth; the bodies of the eighth and ninth were entirely gone, and those of the fifth, sixth, and seventh were partially involved; the intervertebral substance appeared to be unaffected. The immediate cause of death was not, however, very certain. Mr. Callaway believed "that the child, eating heartily, swallowed a portion of food, which passed down to the narrowed gullet, and there pressing forwards upon the trachea produced suffocation; that the probang had pushed this downwards into the stomach, but unhappily too long a time had elapsed for any remedial acts to be effective." This explanation is probably the correct one.

Tumours of the pharynx.

Tumours springing from the pharynx may also pass under observation, either in the form of a polypus or otherwise, simple or malignant.

CASE.—A man was admitted with a polypus of three months' growth, and of a firm fibrous nature, but refusing operative relief he was discharged; these generally grow from the upper part of the pharynx or base of the skull, and should be removed by ligature passed through the nose by means of a double cannula.

CASE.—A man, æt. 20, was admitted, under the care of Mr. Birkett, with a tumour projecting with a broad base from the walls of the pharynx, obstructing the posterior nares; it was feared to.

have been malignant, and, as nothing could be done, he left the hospital unrelieved.

Such cases are of interest pathologically, but little can, however, be done surgically for their removal.

Foreign bodies in the pharynx.

The seat at which any foreign body is liable to lodge in the pharynx is its narrowest portion, and that is situated at the lowest part.

It is by no means an uncommon circumstance for patients to apply for advice in the belief that some foreign body has lodged at the lower part of the throat; it may be a fish-bone, pin, or other article, accidentally taken into the mouth. It is also equally uncommon for the surgeon to detect it; and it is certainly rare for any ill effects to follow simple palliative and negative treatment.

The symptoms appear to be produced in the act of swallowing by some hard substance slightly tearing or injuring the constricted portion of the pharynx, giving rise to the symptoms which the patient assigns to the presence of a foreign body. The surgeon would, of course, in these cases at once carefully examine the throat with his finger, passing it freely round the whole passage; and he should more particularly examine the root of the tongue. He must not be led into the mistake which I have known happen, of regarding the cornu of the os hyoides as a foreign body, this projection being very clearly felt in all subjects.

If any mechanical obstruction is detected, it should be removed by forceps, a long pair being often necessary; but other mechanical appliances, such as would be suggested by the surgeon's ingenuity, may be required to meet the exigencies of the peculiar case. Pressing the body downwards by means of instruments cannot but be regarded as bad surgery; the attempt almost always fails, and does nothing but cause the offending material to become more firmly impacted.

If nothing can be detected, leave the patient alone; calm his fears by giving a positive opinion that nothing exists, and assure him that by a few days' rest, avoiding solid food, and

taking liquids only, convalescence will ensue; these measures allowing time for nature's processes to heal the abraded surface, and thus relieve all symptoms. It is worthy of remark, however, how long a time may elapse before the patient can dismiss the idea of the existence of some such obstruction; and it is right for the surgeon to make several digital examinations with the idea of disproving or rather of relieving the anxieties of the sufferer.

Cases, however, do occur in which a foreign body does really exist, and in which some operative measure may be required. An interesting instance took place some time since in the practice of Mr. Cock, an account of which has been already published in the 'Guy's Hospital Reports' for 1858, by Mr. Cock, with some interesting remarks upon the operation.

Stricture of the œsophagus.

Of all forms of stricture to which man is liable, stricture of the œsophagus is without doubt the most distressing, as by it the sources of existence are imperilled, and, unless relief can be afforded, death by starvation becomes a certainty.

It is a sad but no less true confession that surgical science can do but little to prevent such a termination: it can relieve symptoms, retard the progress of the disease, and, in a measure, delay the approach of death; but that is all. Death will sooner or later ensue, and that too of the most painful kind. My notes furnish me with sixteen examples of this distressing affection, seven being in females and six in males.

1	was	9	years	of	age.
1	between	20	and	30	years of age.
4	„	30	40	„	
5	„	40	50	„	
4	„	50	60	„	
1	aged	65.			

Fifteen were relieved by treatment, and two died. In two of the instances the disease had existed but a few months; in five there was a history of three, three, four, ten, and eleven years respectively.

It is impossible to divide the cases before me into sections,

or to separate the simple from the malignant ; doubtless there were examples of both forms amongst the cases before me.

CASE.—One was evidently of a simple nature, having taken place in a boy, *æt.* 9 years, who three years previously had swallowed some sulphuric acid. After the primary effects had passed away, difficulty in deglutition still continued, and after two years he sought advice ; a probang was passed down to what was believed to have been the stricture, but not through, and relief was obtained. A year subsequently he was again admitted into Guy's, under the care of Mr. Cock ; he was then quite unable to swallow solids, and had not taken any for several months ; a probang was passed with ease, no obstruction being detected ; this operation was repeated several times, and the boy left, able to eat and drink without difficulty.

Remarks.—In this case it is difficult to say, positively, whether any real narrowing of the passage had ever existed ; from its reputed cause, it is not unfair to believe that some contraction of the cicatrised ulcer, caused by the acid, had taken place, and, as a result, some stricture was really present ; this may have been slight, its evil effects having been increased by the presence of a spasmodic stricture. The relief afforded by the treatment tends to support this view, and I am disposed to regard it in that light. The child was fed freely on liquid diet during the treatment, milk, eggs, beef-tea, and wine being the staple articles of food.

I will quote another example illustrating a large class of these cases, together with the treatment which is found to be most beneficial.

CASE.—It occurred in a man, *æt.* 46, who, for ten months, had experienced some difficulty in deglutition, this difficulty being always the greatest on swallowing the first mouthful of a meal.

On an examination made carefully by Mr. Cock, no external signs of mischief could be detected, and a probang slowly passed met with no obstruction ; the instrument was passed every other day for a fortnight, with complete relief to all his symptoms.

Remarks.—This case illustrates the fact that symptoms of stricture of the œsophagus may be present, and even lasting, without any obstruction to the passage being detected by the surgeon; and it also demonstrates the value of the treatment which should be pursued—the occasional passage of the bougie, and for a time the administration of liquid nourishment.

It is probable that spasmodic stricture of the passage was the chief cause, possibly co-existing with some slight organic mischief, which was not sufficiently advanced to allow of its detection by examination. Cases, however, similar to the above are not unfrequent, and should not be treated lightly, as being of no consequence.

CASE.—A man, æt. 58, was admitted under the care of Mr. Cock, having experienced considerable difficulty in deglutition for eight months, attended with much emaciation. A probang was passed with perfect ease, no obstruction being apparent; but a careful thoracic examination detected an aneurism.

Remarks.—This case is given here also as a type of a certain class, which demands close attention; indeed, no surgeon should see a case of reputed stricture of the œsophagus without remembering that an aortic thoracic aneurism may be the cause of all the symptoms; remembering the fact, he is likely to be more cautious in his examination, and still more so in his prognosis. A probang roughly passed, in such a case, may, by injuring the aneurism, cause death; but the recollection of the fact that thoracic aneurism may be sufficient to cause all the symptoms of stricture of the œsophagus will prevent the surgeon falling into such a grave and dreadful error.

The remaining cases were believed to have been genuine cases of stricture; in all positive obstruction was present, and relief was obtained in some by the occasional passage of a bougie, when it could be borne; in these, as in others, liquid food was alone given as nutritious as could be taken; relief was afforded to some extent, and the patients left.

Fatal cases.—One of the two fatal cases took place in a man, æt. 65, who had experienced symptoms but six months.

The second was a woman, æt. 31, who had suffered from the symptoms for three years ; both sank exhausted from starvation : and in neither could a post-mortem be obtained.

CHAPTER XIX.

ON CONTUSIONS OF THE ABDOMEN AND RUPTURED VISCERA.

SECTION I.—*Simple contusions.*

Injuries to the abdomen, like those of the skull, derive their principal importance from the nature of the cavities' contents. The integument and muscles forming its boundaries may be severely injured, and results follow which are of simply local importance ; but if the viscera or the peritoneal lining are involved, the case becomes one of considerable danger, and, as a consequence, the class of injuries included under the heading of this chapter deserves serious consideration.

I possess the notes of seventy-one cases admitted into Guy's Hospital with abdominal injuries, the majority being produced by blows, falls, or the passage of a cart-wheel over the part. In forty-four of these cases no serious or definite symptoms were produced ; tenderness from the contusion was most marked, but no evidence of any internal mischief was ever manifested : rest in bed for a few days was the chief treatment, associated with the local application of a warm fomentation ; in all, convalescence was rapidly established. In ten examples some symptoms of peritonitis, described therefore as traumatic, manifested themselves, such as excessive tenderness over the injured part, increased by movement ; thoracic respiration resulting from the indisposition of the abdominal muscles to act, and thus by pressure on the inflamed peritoncum to cause pain ; nausea, and in some cases vomiting ; fever and constitutional disturbance varying according to the severity of the inflammation. In seven of these cases, absolute rest in the horizontal posture, warmth applied locally either by means of fomentation or cataplasms, in several instances leeching, and in all opium given in moderately full and repeated doses, was

the treatment adopted; and in all the inflammation was subdued before it had attained a dangerous degree of severity. In three cases, however, severe peritonitis set in; and in one of these, a fatal termination was the result.

CASE.—A man, æt. 22, in a fight received a blow from a woman on his right side; the accident was followed by syncope, from which he soon recovered; he felt no pain or inconvenience from the injury for one week, having, as usual, followed his occupation. At this date severe abdominal pain was experienced at the seat of injury, which rapidly increased and spread over the whole abdomen; vomiting also appeared, accompanied with considerable constitutional disturbance; in this condition, he was admitted under the care of Mr. Cock. He was put to bed, and twenty leeches were at once applied; a grain of opium was given, and repeated three times daily, and perfect rest enjoined; in a few days these symptoms subsided, he was enabled to take food without vomiting, and pain ceased, convalescence being gradually established.

Remarks.—The case is interesting from the fact that some days elapsed between the receipt of the injury and the appearance of the peritoneal symptoms, as well as from the important practical point to be learnt from the rapid success which followed upon the treatment which was pursued. Rest, to its fullest extent, was doubtless the chief element of success—rest by position in the horizontal posture, and rest maintained by the administration of opium. It is not unfair to believe that, if this treatment had been primarily adopted, the symptoms exhibited would never have made their appearance; but by the man following his occupation, the repair which was required after the injury could not be efficiently carried out, and, as a consequence, inflammation ensued. Of all cases which require absolute rest, abdominal injuries demand it most, and in no example, however apparently trivial, should it be neglected. If the mischief is but little, that little will more rapidly be repaired; if much, its evils and its consequences will be materially modified. The case above quoted indicates both points, viz., its primary necessity and its secondary good results. The second case of severe peritonitis resulting from an injury also terminated

successfully ; but the third proved fatal. Both were in boys, aged, respectively, fifteen and ten years of age.

SECTION II.—*Contusions complicated with injured viscera.*

A.—*Rupture of the liver.*

In the section just completed, the cases of abdominal injury have been considered in which there was no evidence of any important injury to the abdominal viscera. It has been shown that in the majority of those instances, when correctly treated, peritoneal inflammation is not frequent, and that when it occurs, it can, as a rule, be successfully combated ; this point being illustrated by the fact that in only one case out of fifty-four did a fatal issue take place.

In the cases we have now to consider a very different result must be recorded ; indeed, it will be seen that, as a rule, the termination of the cases are unfavorable, death usually following rapidly after the receipt of the injury.

The liver, spleen, and intestines are all liable to be torn, lacerated, cracked, or crushed by a blow or pressure ; and when such an accident takes place, a fatal result is generally to be anticipated, although there are doubtless on record instances of recovery. When the kidney, however, has received an injury (unless it be a total disorganization), a fatal termination is not so common ; indeed, of all the viscera, it appears capable of receiving with impunity, and of repairing, mischief to its structure more readily than any other. Its anatomical position will perhaps account for this occurrence, an injury to its structure not being necessarily associated with a laceration of the peritoneum ; and the still more important fact, that the kidneys are double, has perhaps a stronger influence in securing such a result ; interference with the function of one being compensated for by the increased action of its fellow. Practically, however, this opinion is found to be correct, and the cases before me well bear out the assertion.

I shall now proceed to quote briefly a few of the cases of ruptured viscera which I possess, and to notice such points of interest as may be present. I have seventeen examples of this class of injuries, including instances of injury to all the viscera.

In thirteen cases a fatal result ensued, and in four recovery took place; it must be observed that in these four successful cases the kidney was the organ which was injured.

CASE.—The first case to be recorded was one of rupture of the liver; it occurred in a man aged forty-five, who, when drunk, fell out of a cart, and the wheel was said to have passed over his head. He was admitted soon afterwards, under the care of Mr. Birkett intoxicated to an extreme degree, and he presented no evident symptoms of internal injury. The right eye exhibited the appearance of sub-conjunctival hæmorrhage, but, beyond that symptom, no evidence existed of cerebral or abdominal mischief. He was put to bed, and soon fell asleep; and on the following morning, with the exception of the hæmorrhage into the orbit, no signs of mischief could be detected. Rest, however, in the horizontal position was strictly enjoined; but to this the man would not submit, and thirty-six hours after the accident he would get up and walk about; having done so, he felt a sudden pain in his side, fell backwards, and died.

A subsequent inspection revealed the fact that the skull was fissured over the right temple, the fracture extending into the right orbit, explaining the appearance of the sub-conjunctival hæmorrhage, and showing its value as a sign of fracture in such a position. The brain was quite uninjured. The chest was also quite normal. The peritoneal cavity contained about a pint of blood, which had evidently escaped from a severe laceration of the liver, a mass, the size of a man's fist, situated in the right lobe, having been nearly separated. The right kidney was also fissured on its surface, and covered with coagulated blood.

Remarks.—The case just quoted is one of interest in many points of view. It points out to us how, by intoxication, any symptoms of internal injury may be masked, and also what severe injury may exist to the abdominal viscera without the appearance of evident signs. In the above case, when the man was admitted, there was no collapse or other local or general symptom of abdominal injury; and even when the results of intoxication had passed away, it was not believed that any such complications existed. The immediate cause of death

was tolerably clear, the hæmorrhage into the abdominal cavity being doubtless the true one; this hæmorrhage having resulted from the man's imprudence in assuming the erect posture. With such an extensive injury as the necropsy revealed, it is scarcely possible to say that a fatal result would not necessarily have ensued; but it is, I think, equally clear that, if perfect rest had been maintained, life would have been prolonged, if not saved.

The important practical point, then, remains to be enforced, that in all cases of positive or even of doubtful cases of abdominal injury rest in the horizontal posture should be maintained; let the surgeon, therefore, never sanction the patient in his desire to assume the erect posture; let him remember always that severe abdominal complications may result from slight injury, and also that extensive mischief may exist without any marked or positive symptoms being present; let his prognosis, as a consequence, always be most guarded, and his treatment cautious. By such a practice, it is true, he may at times make much of a slight injury, but a few days' rest will be the only harm; whilst, on the other hand, by adopting the practice recommended, he will guard against the opposite irremediable error, and not sanction by his authority a line of treatment which may terminate as the case quoted illustrates, and cause the death of a fellow-creature.

The remaining eight cases of lacerated liver contain no special point of interest; five died within a few hours of the injury, and three survived three, seven, and nine days, respectively. Several of the cases were complicated with fractured ribs and lacerated lungs and spleen, the diaphragm in five instances being involved. In two of these the dyspnœa was intense, and the respiration was of a peculiar catching nature; this was sufficiently peculiar to attract notice, and it is alluded to here as a point of interest which may be of use in guiding us to a correct diagnosis in future cases.

The experience of most surgeons will bear out the truth which my materials assert, that laceration of the liver is the most frequent form of injury resulting from an abdominal contusion. Out of the seventeen cases which I possess of ruptured viscera, nine were of the liver. It is true that in several cases

the injury was complicated with mischief to other organs, such as the spleen or kidneys; but the injury to the liver was the most marked. The reason of such an occurrence it is not difficult to divine; it is the largest, most friable, and easily lacerated organ in the abdominal cavity, and must certainly bear the brunt of most general contusions, and of pressure by falls or the passage of a cart-wheel over the abdomen. It is also so situated that any fracture of the ribs on the right side may cause laceration of its structure; and in five cases out of the nine this complication existed. That lacerations of the liver are capable of repair there can be no doubt; preparations and drawings in the Guy's Museum well illustrate the fact.

When such an injury is suspected, the important point remains for consideration of what treatment should be adopted? in the earliest condition, perfect repose is the most essential; beyond that, little can be done. If the patient survives the primary dangers, keep the bowels at rest, and allay pain by opiates. If peritonitis appears, apply leeches and hot fomentations or cataplasms; and give the patient as little food as is consistent with his powers, and that only of the simplest nature, milk and ice being perhaps the best. In the majority of cases, death ensues from collapse, the result of hæmorrhage following the injury; but if the patient escapes this danger, and the injury is uncomplicated, recovery may, by careful treatment, be secured. The great principle of treatment is to maintain repose, check inflammatory action, and allay pain, and thus allow nature by its own powers to repair the rent. If superficial and uncomplicated, I believe this result to be not so rare as is supposed, although, of course, when recovery has taken place, it is difficult to describe with certainty the character of the injury. When these cases occur, they are classed with those of traumatic peritonitis; and when proving successful, their true nature is not revealed. Unfortunately, a laceration of the liver is seldom uncomplicated; consequently, cases of recovery are not so common.

B.—*Rupture of the Intestine.*

The cases of ruptured liver having had a brief consideration, I pass on to quote the few instances of rupture of the intestine

which have occurred in the practice of Guy's Hospital during the last seven or eight years. They are but four in number.

CASE.—J. P—, a man, æt. 37, having fallen from a cart, experienced a severe injury from the passage of the wheel over the abdomen; the accident was not followed by any collapse, nor by any external signs of injury; but vomiting of an obstinate character rapidly appeared, and continued till his death, twenty-four hours after the accident. The only treatment was the administration of ice, of which he partook freely. After death, the jejunum was found to be completely separated from the duodenum at the spot where the latter was bound down to the spine. The ends were four inches apart, and the mucous membrane was everted. Acute peritonitis was present, and three or four pints of a pink-coloured fluid were removed from the abdomen. The stomach was contracted and nearly empty.

Remarks.—This case is a good illustration of a class of cases in which the bowel has been separated by being dragged from a fixed position. My friend, Mr. Poland, in an able monograph on this subject,¹ has shown that in at least 50 per cent. of cases of ruptured jejunum, the seat of the separation is at its junction with the duodenum. The case is also interesting from the fact that no collapse followed upon the injury; and also points out the error of a free administration of any fluid, even of ice, as nearly all of this found its way into the peritoneum, three or four pints having been taken from it after death.

CASE.—Edward T—, an adult, having been run over by a brewer's dray, was admitted into Guy's, under the care of Mr. Cock; he was collapsed and dying, and lived only half an hour after the accident. After death, the ninth and tenth ribs on the left side were found to have been fractured. The abdomen contained a large quantity of blood from rupture of the mesentery and injury to the abdominal muscles; the psoas and iliacus muscles were also completely crushed. The middle

¹ 'Guy's Reports,' vol. iv, third series.

of the small intestine was found to have been lacerated and divided, the ends lying loosely in the cavity; near one of these ends a partial severance had taken place, and at the other end two lacerations existed. The sigmoid flexure of the colon was also stripped of its peritoneal covering.

The kidneys were uninjured. The pelvis was fractured, and the left os innominatum was dislocated at the symphysis pubis and sacrum, the bone being comminuted. The bladder, which was not distended, was uninvolved.

Remarks.—This case, like the former, was evidently caused by a severe dragging of the intestines; the injury was produced in the same way, although the seat of rupture was somewhat different. The fact that the sigmoid flexure of the colon was stripped of its peritoneal lining was a proof of the immense dragging which had taken place, and is interesting as proving that the coats of the intestine can be separated. The copious hæmorrhage into the abdominal cavity had evidently been chiefly caused by the rupture of the mesentery and its veins.

The fact that the bladder was not distended, perhaps, accounts for its having been found uninjured, as otherwise it was difficult to understand how such severe pelvic mischief could exist without involving that viscus.

CASE.—Henry E—, æt. 10, having fallen down with his abdomen towards the ground, was run over, the wheel passing over his back; no collapse followed the injury, and he was admitted without any external signs of violence. Peritonitis, however, quickly set in, and he died sixteen hours after the accident.

On making a post-mortem, an ecchymosis was detected in the muscles of the abdomen, about the size of a hand, on the right side of the umbilicus. The abdomen contained a quantity of fluid blood and effused fæces; acute peritonitis, with recent lymph, also existed. Beneath the bruised abdominal walls lay a small piece of bruised and lacerated intestine (the middle of the small); the rent was about the size of a shilling, and the parts around were soft and of a dark colour from ecchymosis. The mesentery contained at the corresponding spot a clot of black blood, which had evidently come from an opening in the

superior mesenteric vein, which was large enough to admit a quill. The other viscera were healthy.

Remarks.—The injury in this instance was evidently local; the boy had probably been pressed by the cart-wheel against some projecting substance situated beneath his abdomen, which had caused the lacerated and bruised intestine. The case is, therefore, unlike the two previously quoted, in which a dragging had evidently produced the ruptured bowel. The perforation of the mesenteric veins is also a point of peculiar interest, the extravasation of blood having evidently a powerful influence in causing death. The fact that no collapse followed upon the injury is worthy of remark, as the same absence of this symptom was noted in the first case quoted, and will be again in the one which is to follow. Such a symptom is generally given as a certain result of severe abdominal injury; this opinion, however, does not appear to be correct; when it is present, however, such a condition may be feared. Pathologically, it is also to be remarked that, sixteen hours after the accident, the existence of lymph upon the inflamed peritoneum was very evident, showing the rapidity with which inflammation may appear and pour out its products.

CASE.—A boy, æt. 10, was admitted under the care of Mr. Poland, having fallen with his abdomen against a curbstone, some other boys falling on him. The accident was immediately followed by intense abdominal pain, but no collapse; leeches were at once applied, and he was brought to Guy's. When admitted, about thirteen hours subsequently, the abdomen was distended, and all the signs of acute peritonitis existed. Opium was freely given, and ice moderately, to check thirst; enemata of beef-tea were constantly administered, but without benefit, the boy dying on the sixteenth day.

After death, evidence of acute peritonitis was very clear but of a healthy and reparative nature; the intestines were all firmly adherent together, being separated with some difficulty; small deposits of pus were present between some of the coils. On removing the abdominal walls from the colon, this was torn through, ulceration of its coats having apparently taken place at this spot. On the right side of the abdomen a large faecal abscess existed, which extended into the right iliac fossa up

to the liver; at the lower part of the abscess, near to the cæcum, a coil of small intestine (which proved to be the upper part of the ileum) was seen to be perforated by a hole large enough to admit a goose-quill: it was quite free, and gave exit to fæces; it was round, and presented raised edges of everted mucous membrane. The liver was healthy, except where forming the wall of the abscess, which was sloughing. The lungs presented evidences of pyæmic pneumonia.

Remarks.—This case cannot but be regarded with great interest. Here was an instance of ruptured bowel, produced by a local injury, not followed by any collapse, but by symptoms of acute peritonitis. The judicious treatment which was employed evidently controlled the inflammation, as the post-mortem revealed a condition of parts which in its nature was highly reparative, and which by relieving the symptoms had given hopes of a recovery. Pyæmia making its appearance was an unfortunate event, as nothing but a fatal result could then have been anticipated. Quoting, also, Mr. Poland's own remarks, the case is instructive "as showing that life may be prolonged by keeping the bowel quiet, and allowing no irritating purgative to be administered."

CASE.—A fifth case of ruptured intestine may now be recorded, having taken place when occupied in the arrangement of these pages. It was in a man, æt. 49, a patient of Mr. Birkett's, who, when working at the river-side, received a double injury from a bale of wool falling on his shoulder, knocking him back, and a second on his abdomen when down. The accident was followed by feelings of sickness; but the man got up and walked some hundred yards into the hospital; when admitted, ten minutes after the injury, he vomited the contents of his stomach, but no blood. A fractured clavicle was discovered, but there was no evidence of internal injury; he walked upstairs into one of the wards, and went to bed. He complained also of slight pain in the right iliac fossa. Vomiting, however, continued, and he gradually became collapsed, dying twelve hours after the accident. After death, an ecchymosis was observed upon his abdomen. About a pint of blood was found in the peritoneal cavity; and beneath the umbilicus a laceration of the mesentery and ilium, six feet from the

cæcum, was detected. The laceration was altogether on the mesenteric side; it was vertical, and one inch and a half long, extending through the mesentery and its vessels into the intestine, dividing it for at least three quarters of its circumference, leaving a margin of membrane on its outer side. The coils of intestine at this spot were matted together by peritoneal effusion, which had confined the extravasation which had resulted from the ruptured bowel. The peritonitis was only local.

Remarks.—The character of the injury, the fact of the man walking some distance immediately after, and the absence of collapse as a direct result, are the principal points of interest in this case. The form of the laceration in the intestine was also peculiar. The collapse came on gradually, and was evidently the result of hæmorrhage, and not of what is called shock, and supports the conclusion, as enunciated by the other cases, that collapse must not be looked for as a primary result of injured viscera; it appears to come on only when hæmorrhage or peritonitis has set in, and not till then. I have reason to believe that this fact has been dwelt upon by Mr. Hilton, in his surgical lectures, for some years past.

As a fitting conclusion to the consideration of these cases of contusions of the abdomen, associated or not with injury to the viscera, it may not be without benefit briefly to refer to the treatment which is to be pursued.

The chief point to insist on is the absolute necessity of treating every case of injury to the abdomen, either severe or slight, with excessive caution; instances already quoted have proved that very severe mischief may be caused by violence, and yet the immediate symptoms may not be marked. Collapse after the injury is by no means a necessary sequel; rupture of the intestine itself taking place without exciting such a condition. Be guarded, therefore, in prognosis, and careful and expectant in treatment.

In every case require and maintain absolute rest. If the injury is slight, by such treatment convalescence will soon be established; if severe, secondary bad results may be prevented, and at any rate will be relieved.

If local tenderness exists, treat it by fomentations or cata-

plasms; and if such amounts to pain, apply leeches in good numbers—twenty or thirty—and give opium; administer this valuable drug in small and repeated doses, for it answers many purposes—it allays pain, and assists wonderfully in maintaining rest to the injured peritoneum and viscera, tending thus materially to arrest inflammatory action.

Keep your patient free from all excitement, and administer as little nourishment by the mouth as will sustain life; if the intestines are believed to have been ruptured, starvation must be carried out.

What is given should be liquid and cold. Milk and ice is the best and simplest combination, and upon this life will be sustained without difficulty.

If great thirst exists, a little ice may be given; but this must be administered with great caution, as a case already quoted well illustrates. When the intestine is believed to be injured, this latter treatment must be most guarded; and keep the patient's power alive by enemata of beef-tea administered in small quantities—three or four ounces repeated at short intervals.

On no account administer a purgative. This rule is a golden one in these cases, and should never be deviated from; by doing so in a careless moment, the whole of nature's processes in repairing the injury may be undone, and irreparable mischief follow: the constipation is the sign of a condition of bowel to which all our treatment is directed to preserve; namely, their repose: a purgative is nothing but an irritant, and is in its effects absolutely destructive.

In all cases be most guarded in your prognosis, cautious and expectant in your treatment; let perfect rest, locally and generally, be maintained, and let all sources of irritation be removed and kept away; by such treatment, and such alone, can recovery be anticipated, and nature's processes of repair be fully carried out.

C.—*Rupture of the Kidney.*

In a former page I expressed an opinion which, I believe, most surgeons will sanction, and which the materials before me certainly sustain, that, of all the abdominal viscera, the kidney stands prominently forward as being capable of receiving with

impunity and of repairing mischief to its structure more readily than any other.

I possess the notes of four good examples of this form of injury.

CASE.—A man, æt. 25, having fallen a height of four feet upon his right loin, was admitted with profuse hæmaturia, attended with severe local pain. He was kept in bed. Milk diet was given, and a linseed poultice applied over the seat of injury. On the fifteenth day the blood disappeared, pain ceased, and he left convalescent.

CASE.—A German sailor, æt. 26, fell twenty-seven feet down a ship's hold, upon his right side. He was admitted soon after with profuse hæmaturia and concussion of the brain; the latter symptoms soon disappeared, but the bloody urine continued for thirteen days, when he left the hospital, still suffering.

CASE.—A man, æt. 66, fell a height of eight feet upon his left loin, across a stone. His left lower ribs were also fractured. He was admitted with severe local pain and hæmaturia; and it was believed that he had a lacerated kidney, from the fractured ribs. Acetate of lead one grain, with half a grain of opium, was given three times a day; on the seventeenth day the urine became clear, and he left cured.

CASE.—The last case was in a man, æt. 23, and was caused by a blow upon the loin. The blood disappeared on the second day, and he left well.

Remarks.—The four cases just quoted are good illustrations of the form of injury under consideration; a severe blow or fall upon the loins, followed by hæmaturia and local pain, are tolerably characteristic of an injured if not ruptured kidney. Rest in bed, local warmth by fomentations or poultices, and light diet are generally sufficient to ensure a cure; if the blood continues very profuse, the acetate of lead or gallic acid may be given with advantage. The benefit of opium is not quite so clear; in small doses it may be given, but not so freely as in the other forms of visceral mischief.

I have no case to quote of uncomplicated injury to the kidney, which proved fatal. If the laceration is severe, and the peritoneum is involved, doubtless acute peritonitis and extravasation of blood must follow; for urine is unquestionably the most irritating secretion in the body, the slightest drop exciting inflammation. If the kidney happens also to be *single*, as at times is found to be the case, any injury to its structure would almost necessarily be fatal. The following illustration of the fact took place some years ago, and for the particulars of the case, I am indebted to my friend, Dr. Wilks.

CASE.—A boy, æt. 16, was admitted on November 8th, 1847, under the care of Mr. Coek. He had fallen from a considerable height, amongst some timber, upon his side and back. On admission, he was found bruised in these parts, and complained of pain in the abdomen. After a few hours his urine, being drawn off, was found to be bloody. On another occasion, on passing a catheter, not a drop of fluid could be obtained. He then fell into a drowsy condition, and appeared always to be asleep; but he could be roused, and was able to answer questions. He survived the injury ten days, and since the first evacuation of the bladder he passed no urine. He died comatose, having become so only a few hours before death. For the last few days, an enlargement was felt in the left iliac region. From the bloody urine, suppression of its secretion, tumour, &c., Mr. Cock diagnosed rupture of the left kidney, with effusion of blood; the latter having proceeded over to the right side, so as to interfere with the other kidney, “unless,” said he, “the boy has only one kidney.”

Post-mortem.—A little bloody serum was in the abdomen. On removing the intestines, a large quantity of blood, amounting to many pounds, was found effused behind the peritoneum; this was principally in the left loin, arising from the left kidney, which was cut right through, together with the renal artery. A good deal of urine was mixed with the blood; some of the coagulum had passed over the spine to the right side. On looking for the right kidney, none could be discovered, or only the merest trace of a rudimentary organ. The supra-renal capsules were quite perfect.

CHAPTER XX.

ON STRANGULATED HERNIA.

Preliminary remarks.—It is hardly to be expected that much novelty can be written on a subject which has been so fully investigated, and ably treated, as the one affixed to the heading of this chapter; nevertheless, in a work like the present, based as it is entirely on clinical observations, the analysis of the large mass of materials I possess, and the deductions which may be drawn from it, cannot but be of interest to the professors and students of surgical science. It is believed, however, that some important points are now for the first time brought before the profession in these pages; what they are future chapters will reveal, and what influence they may have upon our practice time will prove. It will be my aim to illustrate by facts every opinion which may be written, and to support every line of treatment which may be advocated by a like positive attestation. By such means the correctness of the opinions promulgated can be tested by all readers, and the practice proved by the practitioners of surgery.

Theory, in surgery, can only be of use as long as it is founded on definite and indisputable data. Practice also cannot be regarded as good, unless supported by the theories of correct principles. Thus, true theories and sound practice run hand in hand, and by their mutual relations support and correct each other. By such means alone can sciences of observation be expected to improve, and by such alone has surgery been ever benefited.

It would be an interesting and not a difficult task to demonstrate the evils which have resulted to our science from the influence of authority in the magnates of our profession, when that authority has been exerted in the expression of opinions based only on impressions, and not upon definite and positive data. In these days, men of science are well aware of the fallacies of such a practice, and they are apt to regard with diffidence, if not suspicion, any opinions which are not supported by some positive and indisputable material.

The material upon which these chapters on strangulated hernia will rest is the whole experience of Guy's Hospital for nearly eight years, the observation and analysis of upwards of three hundred cases of the disease forming its basis. This number embraces a large variety of cases, and many forms; it is believed also to be quite sufficient to yield, on its analysis, safe and satisfactory conclusions. Statistics, when used in a limited degree, may prove fallacious; but when more numerous, they can be relied on, if fairly used. It is no argument against their employment that they cannot be applied to every purpose and to everything; and if they are employed for wrong objects, the onus rests against the employers, and not the science. Statistics, like all definite knowledge, may be abused; but thinking men will surely never abandon what is so valuable, for such a reason. It is not a task of difficulty to give a sneer at their expense; but is it less difficult for the sneerers to do the same to all knowledge? If any better form can be given to us of registering "experience," doubtless it will be employed; but, till then, the statistical is the only one, and must be maintained.

Frequency of the different forms of simple and of strangulated hernia.

From the report of the City of London Truss Society, which is unquestionably the only true source of gaining any positive information as to the relative frequency of the different forms of hernia, it is clearly shown "*that, out of every hundred cases, eighty-four are inguinal, ten femoral, and five umbilical, the fraction being divided between the three.*" Briefly analysing the three hundred examples of strangulated hernia, it will be seen that, in each hundred, fifty are inguinal, forty-four femoral, and six umbilical, leading us necessarily to the conclusion "*that femoral hernia is far more frequently strangulated than inguinal, by at least 34 per cent.*"

Relative frequency of the successful application of the taxis and herniotomy in the different forms.

Passing a step onwards, and examining our material with a

view to learn which form of hernia requires operation most frequently, it will be seen that in every hundred cases of inguinal thirty-six require operation, 63·9 being reduced by the taxis; in every hundred cases of femoral, seventy-three are operated upon, and 26·7 are reduced by the taxis; whilst out of every hundred umbilical, twenty-seven are operated upon, and seventy-two are reduced by the taxis; these figures again leading us to another positive conclusion, "*that femoral hernia, when strangulated, requires operative relief by at least 37 per cent. more frequently than inguinal, and inguinal 9 per cent. more frequently than umbilical.*"

The following table will perhaps render these conclusions more obvious :

	Inguinal.	Femoral.	Umbilical.
In every 100 cases of <i>hernia</i> are	84	10	5
" " strangulated <i>hernia</i>	50	40	6
Proportion of cases requiring herniotomy in each form of <i>hernia</i> , in every 100 cases strangulated	36	73	27

With those general conclusions, we will pass on to consider separately the three different varieties of hernia.

CHAPTER XXI.

ON STRANGULATED INGUINAL HERNIA.

I have already shown that, out of every hundred cases of hernia, the statistics of the City of London Truss Society indisputably declare that eighty-four are of the nature of inguinal. My own statistics also equally prove that, in every hundred instances of hernia becoming strangulated, fifty, or half, are of this form; and also that, in every hundred so strangulated, thirty-six, or about one third, require operative relief, the remaining 63 per cent. being reducible by the taxis; from which the following conclusion appears tolerably clear:—"that inguinal hernia is by far the commonest form of hernia; that half the cases of strangulated hernia are of this nature, and that, of these, one only in every three requires operative relief, the large proportion of two thirds being reducible by the taxis."

Sex.—Respecting the sex in which inguinal hernia is found, the Truss Society states that about 3 per cent. are in females. My own figures would lead us to believe that, of the cases of strangulated inguinal hernia, 5·2 per cent. are in women. I possess, however, but one example in which an operation was required. From the same sources it would appear that the right side is its most frequent seat.

In a paper on hernia, published in the 'Guy's Hospital Report' for 1856, I demonstrated that inguinal hernia most frequently made its appearance between the ages of twenty and forty, and became strangulated between the ages of forty and sixty, the average duration of inguinal hernia previous to its strangulation being twenty years. It was also shown, that an inguinal hernia to become strangulated on its first descent was a rare occurrence.

With such general facts, I would now pass on to consider the subject of strangulated inguinal hernia, dividing the subject into two classes of cases; first, those that are capable of being reduced by the taxis, without an operation; and, secondly, those requiring herniotomy.

SECTION I.—*On strangulated inguinal hernia, reducible by the taxis.*

It has been already stated, that at least two thirds of all cases of strangulated inguinal hernia are capable of being reduced by the taxis. I possess the notes of seventy-three examples in which such a practice proved successful, and three of these, or 3·8 per cent., terminated fatally. Sixty-three of these cases, or 80 per cent., were reduced by the taxis, assisted by the warm bath and opium; thirteen, or 19 per cent., were reduced under the influence of chloroform, when all those minor measures had been employed and had failed, and when an operation was believed to have been required.

It is unnecessary in these pages to dwell on the symptoms which characterise a strangulated hernia; it is sufficient to state, that any hernial protrusion associated with local tenderness, hiccough, or vomiting, requires surgical treatment, and that anything like delay must be regarded as dangerous: if the

hernia is irreducible, and symptoms of strangulation make their appearance, from that moment danger is imminent; and it behoves the surgeon at once to use means to reduce the tumour. The taxis, that is, the gentle and uniform pressure upon the protruded bowel or omentum, in order to reduce its bulk, and thus allow it to return by its own natural powers, is unquestionably the simplest and most approved method, and surgeons differ only in the means which may be described as being accessory in carrying out and securing this desirable object. In the very earliest cases—that is, when the hernia has first descended—the taxis, firmly and steadily applied, may with reason be expected to succeed; it must not, however, be employed for any lengthened period—a few minutes, say five, is quite sufficient, and any longer extension of time for its continued application should be condemned. If such means fail, other adjuvants should be immediately put in practice; and that brings us to a point on which a difference of opinion may be entertained.

The warm bath is a remedy which has been long employed, and no surgeon can say that it has not been used with considerable advantage. In a large proportion of the cases which I have tabulated this remedy was used, and with a good result; in most of the sixty-three of the seventy-eight examples it proved of value,—that is, by its use aided by other remedies the taxis proved successful. Nevertheless, it has objections; that is, it as a rule requires time for its preparation, and, as a consequence, entails delay; it is undoubtedly depressing in its nature, this depression lasting for some time after its immediate effects have passed away; and, lastly, must be given the most important reason of all that better, more ready, and effectual means are now at our command.

Opium, again, is another means which is still more valuable as an adjuvant in favouring the reduction of a strangulated bowel by the taxis. Like the warm bath, it is of universal use, and in the majority of the cases which have been treated by the taxis it was employed; nevertheless, there are objections to its administration not unlike those raised against the use of the hot bath: it requires time for its influence to be experienced, which necessitates delay; and it also, in its turn, has been superseded by a more powerful, certain, and effectual practice.

The practice which has now eclipsed in value the means already mentioned is the administration of chloroform; it doubtless possesses in itself all the advantages of the older forms of practice, and none of their evils; under its influence, if the taxis is to succeed, the slightest manipulative efforts will suffice; if the taxis fails, no other path for reduction but by operation lies before us. By its use delay is not occasioned, symptoms are not masked, as may be done by opium, and the danger of long-continued and repeated taxis is annulled. Amongst the seventy-eight instances of reduction by the taxis of an inguinal hernia which I possess, fifteen were completed under the influence of chloroform; and it must be remarked that in nearly all these instances all other means had been attempted and had failed, reduction having been effected by the surgeon who had been called down to perform herniotomy. In none of these cases did any bad or fatal result take place; indeed, convalescence was speedily re-established.

If, then, such success as has been already quoted can be relied on, viz., the reduction by the taxis under the influence of chloroform of nearly 20 per cent. of those cases in which all other means had been employed and had entirely failed, it appears to be a natural and fair conclusion to which we are at once led, namely, that we should, in all cases of strangulated inguinal hernia of any standing, primarily employ the means which have been proved to be so successful, and not waste time by such delay as necessarily follows the use of other remedies when we possess one so incomparably their superior, which embodies in itself all their virtues and none of their evils. This point I have been led to bring before the notice of the profession in a separate paper, which is published in the 'Transactions' of the London Medical Society for the present year.

SECTION II.—*On strangulated inguinal hernia requiring herniotomy.*

One third of all the cases of strangulated inguinal hernia require operative relief. This conclusion is unmistakable, and is a corollary to the assertion contained in the last section, that two thirds can be reduced by means of the taxis; this number

also, I believe, would be materially lessened if chloroform could be primarily used in all instances.

I possess the notes of 44 cases in which herniotomy has been performed; 23 of these, or 52 per cent., proved fatal.

In 9 of these the *sac was not opened*, of which 2 only, or 22 per cent., died.

In 35 the *sac was opened*, of which 21, or 60 per cent., died.

Comparing the two classes of cases, it would appear that those in which the sac was opened are by far the most fatal, the proportion rising from 22 to 60 per cent., being nearly three times as great.

Reviewing the cases in which the *sac was not opened*, two were in infants, patients of Mr. Cock.

CASE 1.—One seven months old; the hernia was strangulated sixteen hours. Herniotomy was performed, and no bad symptoms interfered with recovery.

CASE 2.—The second was a year and a half old. The hernia had been strangulated twenty-four hours, and violent taxis had been employed. After herniotomy rapid convalescence ensued.

CASE 3.—Only one of the remaining successful cases is worthy of record; it took place in a man æt. 60, who had been the subject of a very large left scrotal hernia for twenty years; on admission, it had been strangulated for five days, and the taxis also had been freely applied. It fell under my care, and herniotomy was performed, the size of the tumour increasing the anxiety to reduce it without opening the sac; in this attempt success followed, a mass of omentum being left behind; on the third day after its reduction the scrotum, however, became as large as ever, evidently from inflammation. On the eighth day, as it was clearly distended with fluid, I made a free opening into the sac, and evacuated upwards of ten ounces of pus; from this time everything progressed favorably, the omentum gradually contracted, and the sac with it, the man leaving the hospital well. I have since seen him, and he is now well able to wear a truss.

Remarks.—This case is a good illustration of inflammation

of the sac after the reduction of a hernia ; the omentum had probably acted as a perfect plug to the sac's neck, and had thus prevented the pus passing upwards into the abdominal cavity. It might be said by the advocates of the practice of opening the sac in all cases, that if such a practice had been followed the collection of pus would never have taken place ; but, on the other hand, if the sac had been opened, from the size of the hernia a large mass of intestine would necessarily have been handled, and the danger of a hernia appears in a great measure to depend upon the extent of intestine which has been involved. In an old man, to have been obliged to manipulate a mass of intestine would seem to incur immense risk, and I impute the successful termination of the case to the fact that such manipulation was not required.

The secondary inflammation of the sac was a result which was as unusual as it was interesting, and in its effects was really beneficial, as the man has now only a firm omental protrusion blocking up the neck of the old sac.

CASE 4.—One of the successful cases was in a woman æt. 55 ; the hernia had existed in the left side for twenty-seven years, and had been strangulated thirty-two hours. After herniotomy by Mr. Hilton recovery rapidly took place.

The two fatal cases were in men æt. 49 and 50 ; the hernia had been strangulated in both many hours, and in both symptoms of peritonitis existed prior to operation, death taking place from that cause.

Remarks.—In these cases little hope can be entertained of recovery, even after operation. Peritonitis having become established, the relief of the strangulated bowel has seldom much influence in arresting the progress of the disease, and it is, I believe, true that in the majority of fatal cases this peritonitis has existed prior to any operative relief.

Reviewing the 35 examples of herniotomy in which *the sac was opened*, 21 died and 14 recovered. Of the successful cases it is worthy of remark that six were *congenital*, their ages being respectively 17, 18, 29, 38, 44 and 45. In the

remainder the hernia had existed for some years, and were in middle-aged or old men.

The following are briefly quoted as being of interest :

CASE 5.—*Non-descent of testicles ; strangulated hernia ; operation ; recovery.*—A boy, æt. 17, was admitted, under the care of Mr. Birkett, with symptoms of strangulated hernia of thirty-two hours' duration. His testicles had not descended from the abdomen, and at both inguinal canals there was a fulness which could not be diminished by pressure. The left side, appearing the largest, was selected for operation. A hernia was detected, and its sac was opened, a knuckle of congested intestine being returned. Symptoms immediately ceased, and convalescence followed.

CASE 6.—*Second operation of herniotomy ; reduction of hernia by the taxis ; continuation of symptoms ; exploratory operation, with relief ; recovery.*—A man, æt. 60, was admitted under the care of Mr. Poland. He had been the subject of a hernia on the right side for twenty years, and had been operated on by the late Mr. Morgan for strangulated hernia fourteen years previously.

The hernia had been reduced prior to his admission, but the symptoms continued, vomiting having existed sixty-eight hours after the reduction of the hernia. Mr. Poland determined to explore the part, and cut down upon the internal ring ; the sac, which was found to be high up within the abdomen, was forced down by the patient, secured, and opened ; nothing, however, was detected in it except serum, but its coats were thick. All symptoms, however, disappeared, and recovery took place.

Remarks.—The history of this case is full of interest and of practical value. The position of the sac high up within the ring was a point of peculiar interest, and for an explanation of the case, and others of a like nature, I must refer the reader to the 'Guy's Reports' for 1861, in which the subject is discussed by Mr. Birkett.

CASE 7.—*Double hernia and operation ; recovery.*—A man, æt. 70, was admitted under the care of Mr. Cock with a double inguinal hernia and symptoms of strangulation. The

hernia had existed in the right side for fifteen years, and on the left for thirteen, and he had worn a truss. When admitted, the hernia in the left side was strangulated, and was operated upon twelve hours after the appearance of the symptoms; the sac being opened: twelve hours subsequently, symptoms continuing, a strangulated hernia was discovered on the right side, the patient declaring that it had come down and been irreducible only after the previous operation. The sac was opened in this instance also, the intestines in both cases having been found only much congested. The symptoms ceased. The bowels acted on the fourth day, and convalescence followed.

CASE 8.—*Direct inguinal hernia; herniotomy; recovery.*—A man, æt. 65, was admitted under my care with a direct left inguinal hernia; it had existed for thirty-four years, and he had worn a truss. Symptoms of strangulation had been present for forty-eight hours. Herniotomy was performed, and the sac opened. On the ninth day the bowels were relieved for the first time, and recovery took place.

Remarks.—This case is quoted as a solitary example of direct inguinal hernia, and also to illustrate the fact that a patient may pass many days after operation before any action of the bowels may take place, without detriment.

In the same series of cases I may quote a second example to illustrate the same fact.

CASE 9.—It was in a man, æt. 37, who had been ruptured in the right side for six years, and when admitted under my care had had symptoms of strangulation for twenty-four hours. Herniotomy was required, and the sac was opened, the intestines being black and inflamed. One grain of opium was given every four hours for three days, and repeated at longer intervals. On the tenth day the bowels were for the first time relieved, no uncomfortable symptom having presented itself, and no purgative having been given. Convalescence speedily followed.

This point, however, will be dwelt upon in a future page.

Passing on to consider the *fatal cases in which the sac was opened during the operation*, the first point which strikes the attention is the fact that they are so numerous.

21 out of the thirty-five cases having a fatal termination, or 60 per cent.

5, or 24 per cent., are described as *congenital*, their ages being respectively 23, 24, 36, 43, and 48; in the 14 successful cases, 6, or 43 per cent., were quoted as being of this form.

4 were *recent*, that is, had but lately descended, and had become strangulated on their first descent. And

12 were *old*, of many years' duration.

Two of these cases were described as being direct hernia, the fact having been proved by a post-mortem examination.

The following cases, presenting points of interest, are briefly quoted.

CASE 10.—*Strangulated hernia ; gangrenous bowel ; artificial anus ; internal strangulation.*—J.C—, æt. 48, was admitted under the care of Mr. Cock with a right congenital scrotal hernia, forty hours after its strangulation. Herniotomy was performed. The intestine was found to be sloughing and perforated, it was therefore opened and its edges stitched to the wound. On the second day a profuse discharge appeared from the wound, of a bilious, alkaline mucus. On the third, flatus passed per anum. The contents of the small intestine passing so rapidly through the groin, beef-tea enemata were given with great benefit. On the thirteenth day solid fæces passed the natural way. The man appeared to be doing well till the twenty-fourth day, when he was suddenly, after sitting up to take some wine, seized with faintness, followed by collapse, and in twenty-four hours he died. Nineteen hours after death the following conditions were discovered. The peritoneum was quite healthy. A portion of the jejunum was firmly adherent to the external and internal rings, and a free communication existed externally through the artificial opening. Several old adhesions were present also near the ring. The jejunum, for about two feet above the seat of hernia and three inches below, was of a deep colour from venous congestion, and at the termination of this congestion a small band of adhesions existed, extending from the ileum to the mesentery, which had caused complete

strangulation; below this spot the intestines were contracted and empty.

Remarks.—This case is of interest from the complication of hernia and internal strangulation. How far the band which had at last caused a fatal result was produced by the old hernia it is impossible to say, but it is not unfair to believe that it was caused by some former attack of inflammation.

CASE 11.—*Strangulated hernia; sloughing sac; artificial anus.*—A. N—, æt. 35, admitted with left scrotal hernia of five years' duration and forty-five hours' strangulation. He was operated on by Mr. Cock, and the sac was found sloughing, together with the omentum. No intestine was observed. On the third day fæces passed freely from the wound, and on the eleventh he died. The necropsy revealed the fact that peritonitis existed, glueing all the intestines together. The lower part of the ileum, which had been the seat of strangulation, was completely divided, the lower end, opening directly into the sac, was contracted, and the upper, fixed at the side of the opening, had no free passage externally. The whole of the small intestines were of a deep-red colour, from congestion; the mucous membrane was also covered with granular lymph.

Remarks.—This example of artificial anus, the result of a sloughing hernia, is a fair sample of a class. Having been left to nature, the local repair was good, although a free passage from the upper bowel did not exist. The gradual sinking of the patient is the general termination of these cases, exhaustion, as a rule, being the cause of death.

Such cases as the two just quoted afford us some hints for practice, and the question occurs as to the best mode of treating a sloughing hernia; whether it is best to lay the parts open and stitch the bowel to the edges of the wound, or leave the whole to nature, having freely exposed the gangrenous intestine. In a paper in the 'Guy's Reports' for 1856 I showed that the weight of evidence went to prove that the latter practice is the best, and subsequent experience has confirmed me in that opinion. It appears better as a primary point of practice, and also affords the best chance for a subsequent recovery.

CASE 12.—*Scrotal hernia, mistaken for hydrocele, and tapped; peritonitis and death.*—J. R—, æt. 42, the subject of a scrotal hernia for three years, was tapped two days before admission by a surgeon, who, it is supposed, mistook the case for a hydrocele. Some fluid and blood were drawn off, but the swelling rapidly reappeared. When admitted, under the care of Mr. Cock, the scrotum was much swollen, and full of blood and fluid; no symptoms of strangulated hernia existed. The tumour was again punctured, and blood only escaped; an exploratory operation was consequently performed, and a hernial sac found, containing the intestine; in this an ulcer, the size of a sixpence, existed, opening into the intestine. A portion of this was returned into the abdomen, the perforated part being left in the sac. The man died thirty-six hours after the operation. After death acute general peritonitis was seen; a coil of the middle of the ileum existed at the neck of the sac, which was of a dark colour, and at its extremity an opening existed, occupying more than half the width of the bowel, and through which the finger could be passed; this had evidently been made by a knife or trochar. The lower part of the bowel was contracted; the viscera were healthy.

Remarks.—This case is quoted as a sad result of malpractice. There was no doubt about the fact that the hernia had been perforated, but the symptoms of strangulation were not evident; acute peritonitis was clearly the cause of death.

CASE 13.—*Strangulated hernia; apparent reduction by the taxis; exploratory operation; strangulated intestine in a second sac; reduction; peritonitis; death.*—A man, æt. 24, was admitted with a congenital hernia on the left side, which had been strangulated seven days. The left testicle also had not descended. The taxis had been employed prior to admission, pressing the tumour out of sight, but the symptoms continued. Mr. Hilton explored the parts, and came down upon inflamed omentum; examining the neck of the sac, intestine was discovered pushed upwards, apparently external to the peritoneum, towards the iliac fossa; this was drawn down and returned into the abdominal cavity. The man died three hours subsequently.

After death the intestines were seen to be distended from early peritonitis, but no exudation existed. The lower part of the ileum was found lying in the abdominal cavity, of a purple colour; the upper end of the strangulated portion was completely ulcerated through as far as the mesentery, the ends lying wide open. The whole of the omentum had passed into the sac, but was loose.

On examining the interior of the abdomen, the internal ring was clear; within it an opening existed, passing into a second sac lying on the iliacus muscle; this sac, the size of an ordinary egg, was lined by a serous membrane, and was evidently a second sac formed by a dilatation of the peritoneum, as it was continuous with that membrane in the abdomen and scrotum. At the neck of the sac the testis was seen lying at the posterior part, the gland being smaller than its fellow.

Remarks.—This case is a good example of a most difficult and obscure class of cases; it was not an example of reduction *en masse*, but was an illustration of one of the complications of hernia which Mr. Birkett has lately brought before the notice of the profession in an able paper published in the last volume of the ‘*Medico-Chirurgical Transactions*.’ The practice adopted in the case was doubtless the correct one, a careful exploration and examination of the neck of the sac being requisite in all such examples.

The four following cases are given, as in all the larger intestine was involved.

CASE 14.—*Enormous scrotal hernia, containing cæcum, &c.; peritonitis and death.*—A man, æt. 51, was admitted under the care of Mr. Hilton, with a direct scrotal left hernia of twenty-eight years’ duration, and of twenty-four hours’ strangulation. It was of enormous size, and herniotomy was required; a large mass of omentum was down; and inflamed intestine of a dark colour. Thirty-eight hours after the operation a profuse discharge took place from the bowels, followed by collapse and death in two hours.

After death the scrotum was the size of a child’s head, and contained several feet of intestine, including the whole of the

cæcum and the last nine feet of the ileum. On the outer side of the neck of the sac the spermatic cord passed, and with it a ligatured blood-vessel—the epigastric artery. Acute peritonitis was present, involving the abdomen and sac.

CASE 15.—*Large scrotal hernia ; reduction ; one profuse attack of vomiting ; collapse and death.*—A man, æt. 50, was admitted with an enormous hernia on the right side, of many years' duration ; symptoms of strangulation having existed twelve hours. Mr. Hilton operated and returned the bowel, which was apparently all small intestine. Immediately after its reduction the man vomited about three pints of fæcal matter, and died in five minutes. An examination only of the sac could be obtained, when the whole of the ascending and transverse colon was found in the sac ; this probably had come down after the small intestine had been reduced.

CASE 16. — *Strangulated hernia ; irreducible intestine opened, contents evacuated, wound stitched up ; peritonitis and death.*—W. D—, æt. 65, admitted under the care of Mr. Poland, with right scrotal hernia, which had existed twenty years, and had been strangulated only seven hours. Violent taxis had been employed for an hour and a half before admission. Herniotomy was performed ; the intestine, which was down, could not be reduced ; it was believed to be cæcum. The intestine was therefore opened, its contents evacuated, and the wound again stitched up. Peritonitis, however, appeared, and death on the third day. After death, evidence of recent peritonitis existed upon the old, which had completely bound together the intestines into one mass, giving rise to the appearance of the cæcum in the hernia. The wound in the bowel, which was in the small intestine, had completely healed, no signs of it existing from within. Externally the stitches were visible. The viscera were healthy.

Remarks.—The interesting point in this case was the matting together of the intestines by old inflammation, giving rise to the appearance of cæcum and preventing its reduction. The repair of the wound in the part was a point also to be observed.

CASE 17.—*Large scrotal hernia ; herniotomy ; peritonitis ; death.*—D. W—, æt. 33, the subject of a hernia for seven years, which had descended suddenly into the serotum, was admitted under my care with symptoms of strangulation of seven hours' duration. Herniotomy was required, and the cæcum, with three feet of deeply congested small intestine, were returned. The bowels acted within eleven hours, acute peritonitis set in, and death followed in forty-eight hours. Acute general peritonitis was seen after death.

Remarks.—This case is quoted simply as an example of hernia containing large intestine, and also to illustrate the general result of the strangulation and manipulation of a large portion of the intestine. The larger the hernia, if exposed to the air and to the fingers of the operator, the greater the danger ; all efforts should be consequently employed to reduce the tumour without opening the sac.

Having thus so far considered the two great classes of strangulated hernia, one or two other points press upon our notice which may be considered worthy of a passing remark.

Amongst the 78 examples of strangulated inguinal hernia reduced by the taxis—

2	only	were	described	as	being	recent	in	their	origin.
17	"	"	"	"	"	"	"	"	congenital.
59	"	"	"	"	"	"	"	"	old.

In the 9 cases of herniotomy in which the sac was not opened—

1 was recent, and died.
2 were congenital.
6 old, 1 of which died.

In the 35 examples in which the sac was opened—

6	congenital	} recovered.	5	congenital.	} died.
	and		4	recent, and	
8	old cases		12	old.	

Classing all these cases together, it will be observed that there were—

30	cases, or 24·5 per cent., of congenital hernia.
7	„ or 5·7 per cent., were recent hernia, strangulated in their first descent.
85	„ or 70·0 per cent., old, that is, had existed many years.

Analysing the 30 cases of strangulated congenital hernia—

17, or nearly 57 per cent., were successfully reduced by the taxis.

13, or about 43 per cent., required operation, and of these 38 per cent. proved fatal.

Of the recent cases—

2 only were reduced by the taxis, or 28 per cent.

5, or 72 per cent., were subjected to herniotomy, all of which died.

Of the old cases—

59, or 70 per cent., were reduced by the taxis, 5 per cent. of which died.

26, or 30 per cent., were reduced by operation, 10 per cent. of which died.

Arranging these points in a table to allow of easy comparison—

Comparative frequency of the three forms.			Reduced by taxis.	Reduced by herniotomy.	Fatal after operation.
Congenital	.	24 per cent.	57 per cent.	43 per cent.	38 per cent.
Recent	.	5 7 „	28 „	72 „	100 „
Old	.	70 „	70 „	30 „	50 „

Conclusions.

1. That of all the cases of strangulated inguinal hernia, 64 per cent., or about two thirds, are reducible by the taxis, the remaining third requiring operative relief.

2. That in at least 19 per cent. of the cases returned by the taxis success has been obtained by the influence of chloroform when all other means had been attempted and had failed.

3. That death takes place in 3·8 per cent. of the cases reduced by the taxis, and in 52 per cent. of the cases operated upon.

4. That of the cases of strangulated inguinal hernia—

24 per cent. are “congenital.”

5 „ „ “recent,” and strangulated in their first descent.

70 „ „ “old,” that is, have existed for years.

5. That in cases of *inguinal hernia becoming strangulated on their first descent*, or “recent” cases, reduction by the taxis is seldom accomplished; that the sac is, as a rule, required to be opened, and that a fatal result is unfortunately the rule.

6. That in cases of *strangulated “congenital” hernia*, more

than half are reduced by the taxis ; that in 85 per cent. of the cases requiring operation the sac will require to be opened and a fatal result ensues in about 38 per cent.

7. That in cases of "old" hernia, that is, where the hernia has existed for years (twenty years being the average), 70 per cent. are reduced by the taxis ; in 77 per cent. the sac will require to be opened, and 50 per cent., or half the cases operated upon, terminate fatally.

8. Reduction by the taxis is most successful in "old" strangulated hernia, reducing more than two thirds ; one half of the cases of strangulated "congenital" are also amenable to this treatment, and in the "recent" cases it is seldom successful.

9. That herniotomy is most successful in "congenital" hernia, about two thirds recovering ; half the cases of "old" hernia operated on recover ; but this operation is almost always fatal in "recent" cases.

10. That in herniotomy for inguinal hernia the sac is required to be opened in 80 per cent., and unopened in 20, and that death takes place in 22 per cent. of the latter class of cases, and in 60 per cent. of the former.

The latter conclusions, brought out by the careful consideration of the cases of strangulated hernia requiring herniotomy, renders the second a point of greater importance. In the cases of herniotomy it has been shown that more than half the cases operated upon proved fatal ; it has also been shown that in the cases reduced by the taxis success had been obtained in at least 19 per cent. by the use of chloroform when all other means had been attempted and had failed. Indeed, in all these instances the attendance of the operator had been requested. It will hardly be thought an unfair thing to consider these fifteen cases so treated as cases rescued from the dangers of herniotomy, and a large proportion of them consequently from death. If the use of chloroform as a means of securing the reduction of a strangulated hernia had not been recognised, the whole of these cases would have been operated upon ; and counting these 15 cases together with the 44 which required herniotomy, 59 would have been the figure upon which this paper would have been based. It may fearlessly, then, be stated that chloroform has rescued at least 25 per cent. from

the dangers of herniotomy. No mean triumph, indeed, and certainly sufficient to encourage the practice which I trust some day to see general, namely, the primary treatment of all cases of strangulated inguinal hernia (not very recent) by chloroform, such a practice being doubtless the safest, most speedy, and effectual in securing the successful application of the taxis.

CHAPTER XXII.

ON STRANGULATED FEMORAL HERNIA.

Again referring to our only true guide as to the relative frequency of femoral hernia, the City of London Truss Society, it has been shown that in every hundred cases ten are of this nature. My own table of strangulated hernia informs us that, in the same number, forty-four are femoral. It has been also shown that in every hundred cases of strangulated femoral, seventy-three require operation, not twenty-seven being reducible by taxis.

Respecting the *sex*, it would appear that femoral hernia takes place in 10 per cent. in males, and that of the cases strangulated 14 per cent. occur in men.

In my article on hernia published in the 'Guy's Hospital Report' for 1856, it was shown that femoral hernia, in the majority of cases, made its appearance in old age, that is, between fifty and seventy years of age; and that this form is far more frequently strangulated on its first descent than inguinal.

Summing up these facts into a general conclusion, it will be seen—

Conclusion.—That femoral hernia is less common than inguinal by 74 per cent.; that it, as a rule, makes its appearance between fifty and seventy years of age; that it is far more liable to strangulation, and to strangulation on its first descent, than inguinal, 44 per cent. of the cases of strangulated hernia being of this nature; and that when strangulated, 73 per cent. require herniotomy, not 27 per cent. being reducible by taxis.

With these general facts, we will now pass on to consider the subject, first dwelling on the cases in which reduction by the taxis proved successful; and secondly, the larger class in which herniotomy was required.

SECTION I.—*On strangulated femoral hernia reducible by the taxis.*

It has been already stated that scarcely 27 per cent. of these cases of strangulated femoral hernia are reducible by the taxis, this fact standing in marked contrast with the cases of strangulated inguinal hernia, in which two thirds, at least, are reducible by such means. Out of 142 cases of strangulated femoral hernia, 38 only are arranged in this class; 4 of them died, or 10·5 per cent., the mortality of these cases being nearly treble that of inguinal hernia.

Analysing the 38 cases, it will be seen that—

10 cases, or 26·3 per cent., were of “recent” origin; that is, were strangulated on their first descent; all recovered.

28 „ or 73 „ were of older date, having existed months or years; 4 of them died, or 14 per cent.

One of the successful instances had been operated upon the same side one year and a half previously for strangulated hernia. The warm bath and the taxis were the chief means employed in these cases, opium also having in some few instances been administered. In one only was reduction successful under the influence of chloroform when other means had failed. This point is worthy of remark, more particularly when contrasted with the success obtained by the use of these means in inguinal hernia; the taxis, it has been shown, is by no means successful in reducing a strangulated femoral hernia, and chloroform is also a much less valuable adjuvant in securing such an end than it is in inguinal. The taxis should be very cautiously applied in cases of strangulated femoral; force is far more dangerous in this form than it is in the former, although in both it is indefensible. If chloroform is given, a very slight manipulation will, as a rule, suffice; powerful pressure in both forms cannot be too strongly reprehended.

SECTION II.—*On strangulated femoral hernia requiring herniotomy.*

In a former page I have shown that femoral hernia, when strangulated, requires operative relief in 73 per cent. My table of 104 examples also fairly demonstrates the fact that 44 died, or 42 per cent.; being less fatal than herniotomy for inguinal by 10 per cent.

In 59 cases, or 56·7 per cent., the sac was opened; 50 per cent., or half of the examples, proving fatal.

In 45 „ or 43·3 „ the sac was *not* opened, death taking place in only 30 per cent.

The cases in which the sac was opened being the most fatal by 20 per cent.

Analysing these cases still further, it will be observed, that of the 59 cases in which the sac was opened—

8, or 13·5 per cent., were “recent,” that is, were strangulated on their first descent, and 51 old in duration, or 86 per cent.

Of the recent cases 87·5 per cent. died.

Of the old „ 45 „ died.

Of the 45 examples in which the *sac was not opened*—

13 were recent, or 28·8 per cent., and 32 old.

Of the recent cases about 54 per cent. died.

Of the old „ 22 „ died.

Taking out the “recent” cases for analysis, it will be seen that of the 21 examples in which herniotomy was performed—

In 13, or 62 per cent., the sac was not opened.

8, or 38 „ „ opened.

Of the 83 old cases in which herniotomy was called for—

In 32, or 38 per cent., the sac was not opened.

51, or 62 „ „ opened.

The proportion in per-centages of the two classes of cases being exactly reversed. In recent cases the opening of the sac not being so frequent.

Taking again the whole number of cases *in which the sac*

was opened, 13 per cent. were recent, and 87 per cent. old. Whilst those in which the sac was not opened, 28·8 per cent. were recent, and 72 per cent. old.

To show these interesting facts more clearly, the following table has been drawn up; each figure representing a percentage.

Strangulated Femoral Hernia.

Frequency of occurrence in per centages.	Reduction by the Taxis.		Herniotomy.		Herniotomy. Sac opened.		Herniotomy. Sac not opened.		Total.
	Number.	Mortality.	Number.	Mortality.	Number.	Mortality.	Number.	Mortality.	Mortality.
Recent 21·5	32	0	68	·66	38	87	62	54	45
Old 78·5	25	14	75	36	62	45	38	22	30
Whole number	27	10	73	42	56	50	44	30	33

The facts illustrated by this table all point in one direction; they clearly show the necessity of separating the cases of femoral hernia which become strangulated on their first descent, and described in these pages as “recent,” from the large class of cases in which strangulation had only appeared months or years after the hernia had first taken place, and which have consequently been described as being “old.”

These cases differ in every point, and the more that difference is looked for, the greater appears to be the necessity for the distinction. Summing up the several points into general conclusions concerning recent and old hernia. The following appear to be tolerably clear.

Conclusions concerning cases of RECENT femoral hernia becoming strangulated.

1. That they form 21 per cent. of the whole number of cases of strangulated femoral hernia, and that 45 per cent. are fatal.

Conclusions concerning cases of OLD femoral hernia becoming strangulated.

1. That they form 78 per cent. of the whole number of cases of strangulated femoral hernia, and that 30 per cent. are fatal.

2. That 32 per cent. of these cases are reducible by the taxis, and with general success.

3. That herniotomy is required in 68 per cent., and of these 66 per cent. subsequently die.

4. That of the cases operated on, the sac was opened in 38 per cent., death following in these cases in 87 per cent.

5. That the sac was not opened in 62 per cent., the death rate in these falling to 54 per cent.

2. That 25 per cent. of these cases are reducible by the taxis, and that 14 per cent. of these die.

3. That herniotomy is required in 75 per cent., and that death follows in 36 per cent.

4. That of the cases operated on, the sac was required to be opened in 62 per cent., death taking place in 45 per cent.

5. That the sac was not required to be opened in 58 per cent., the death rate in these being only 22 per cent.

Comparing these two tables of conclusions concerning the cases of strangulated "recent" and "old" femoral hernia which the facts previously given unquestionably authorise, the following deductions appear necessarily to follow.

1. That at least one fifth of the cases of strangulated femoral hernia are "recent," and that these cases are 50 per cent. more fatal than the cases of strangulated "old" hernia.

2. That the taxis in recent cases is the most successful, and that it is seldom followed by a fatal result.

3. That herniotomy is less seldom required in these "recent" cases, but that when it is, it is nearly twice as fatal.

4. That the sac is not required to be opened so frequently in "recent" as in "old" cases, by at least 28 per cent. The proportions between the cases in which the sac was opened or not in the two classes of cases being exactly reversed.

5. That where the sac is opened, death takes place more frequently in "recent" cases by at least 33 per cent., or one third; and in "old" hernia the mortality is twice as great.

The practical deductions to be gained by the consideration of these facts are not unimportant. They increase our anxiety to return a "recent" strangulated femoral hernia by the taxis,

and thus to do away with the necessity of herniotomy. They also show us that the taxis should be employed more cautiously in "old" hernia. They satisfactorily prove to us the benefit of operating without opening the sac; the difference in the mortality, both in "recent" and "old" cases, falling in the former 33 per cent., in the latter 23 per cent. The cases in which the sac was opened being in the "old" twice as fatal.

It must be observed, also, that the facts revealed by the analysis of these cases are by no means calculated to give the most favorable aspect to the operation without opening the sac, as it includes the cases of several of my colleagues, who are not converts to the benefits of the practice, and who invariably open the sac. It is fair to believe, then, that if the result of the practice as given is favorable comparatively, it would be still more apparent if the same practice had been carried out in all cases; as it is, however, it appears to be strongly in favour of the minor measure, whether we consider the cases as a whole, or divided up into what I maintain to be the only correct plan, the "recent" and "old" cases of strangulated hernia. To classify these two classes of cases together evidently misleads, and I believe all surgeons who will compare the two tables previously quoted, will at once understand the wisdom of their separation, and also the necessity.

Artificial anus.—Amongst the whole number of cases I possess are twelve examples of artificial anus. In three, fæces escaped from the gangrenous bowel at the time of operation, and all died; one lived, however, twenty-four days, dying from exhaustion. Two were formed by the surgeon, who slit up the gangrenous intestine, both dying. Five appeared at different periods after the reduction of the hernia; in two of these the sac was not opened by the operator, and one recovered; the remaining four died.

In the three cases in which the sac was opened, the intestine was black, but not perforated; in all it was returned, and fæces appeared at the wound on the second, fourth, and sixth days respectively. Death following on the fifth, fourteenth, and eighth days.

One of the two cases in which the sac was not opened was in an old workhouse woman, aged seventy-two, without power;

on the ninth day fæces appeared at the wound, and on the nineteenth she sank exhausted.

The second was in a woman, aged fifty-six. Fæces appeared through the wound on the sixth day; in three weeks the wound had ceased to discharge, and recovery followed.

One of the remaining cases was in a woman, aged eighty-one, who had suffered from strangulated femoral hernia for six days; and twenty-four hours previous to her admission something had been reduced. The symptoms continuing, an exploratory operation was performed by Mr. Cock. The sac was opened, but no intestine discovered, a fish-bone and fæces filling the sac. She lived but eight hours. After death acute general peritonitis was seen, and extravasation of fæces. The femoral ring was free, but near it rested a portion of small intestine, which was perforated; it appeared as if a small knuckle of it had been strangulated, and had given way, and had subsequently retracted from the sac.

The last case was in a woman, aged thirty-three, in which the intestine was slit open; recovery subsequently took place.

With this analysis of cases, I shall proceed to quote a few of the instances which present any points worthy of remark.

CASE 1.—Double hernia; operation on right side; spontaneous reduction of left; recovery.—A woman, æt. 61, four months prior to her admission, under the care of Mr. Cock, discovered a hernia in her right groin, following upon what she called spasms, attended with pain in the part and retching; she took remedies for these symptoms, but without benefit; her bowels, however, acted at times. These symptoms becoming worse, she came to Guy's; when admitted, a femoral hernia was discovered to exist on both sides, both being apparently strangulated. Peritonitis also appeared present. The taxis was employed, but without success, and an operation was performed on the right side, as in this the tension was the greatest; the sac was opened, and a knuckle of congested inflamed intestine returned; the left hernia was not touched, ice being applied to it. On the second day, the symptoms still continuing, and peritonitis apparently becoming worse, the powers of the patient failing, an operation on the left was urgently recommended, the patient, however, obstinately refused, and death appeared

imminent. During the night of the fourth day of her admission the left hernia disappeared, having suddenly gone up; from that moment all symptoms were relieved, the powers of the patient rallied, and the bowels freely acted, convalescence being gradually re-established.

Remarks.—The case is interesting in many points of view, but is more particularly so, as presenting an example of *spontaneous reduction*; there was no doubt that the continuation of the symptoms had been caused by the incarceration, if not strangulation, of the left hernia; these symptoms immediately ceasing when the hernia had been reduced. Such cases of spontaneous reduction occasionally occur, and as an additional example the following may be quoted.

CASE 2.—*Right strangulated recent femoral hernia; spontaneous reduction.*—A woman, æt. 25, was seized twenty-four hours before admission with symptoms of strangulated femoral hernia. The hernia having become strangulated on its first descent; taxis, bath and taxis had been tried and failed; Mr. Poland was accordingly sent for to perform herniotomy, everything was prepared for the operation, when the patient was requested to alter her position to allow of an examination being made, at this slight movement the intestine was released, and the hernia, with the symptoms, disappeared.

CASE 3.—*Strangulated hernia; sloughing sac and integuments; inflamed bowel; herniotomy; recovery.*—A woman, æt. 68, having had a femoral hernia for twelve years, and worn a truss, was admitted, under the care of Mr. Cock, with symptoms of strangulation of one week's duration. She was collapsed, and the parts were sloughing. An incision was made into the sac, which was a complete slough, a coil of strangulated intestine, black and covered with lymph, being returned; a full dose of opium was given, and a quarter of a grain ordered every four hours; wine also was freely administered. Everything progressed well; all symptoms disappeared, the patient's pulse improved, the bowels acted spontaneously on the fifth day, and recovery took place.

CASE 4.—*Herniotomy; sac not opened; death from hæmorrhage.*

rhage external to peritoneum.—A woman, æt. 52, was admitted, under the care of Mr. Cock, with strangulated femoral hernia of five hours' duration, although she had been ruptured many years. The taxis failing, herniotomy was performed, the sac not being opened; the operation was attended and followed by hæmorrhage, but the application of a piece of sponge within the wound readily arrested it. The powers of the patient, however, gradually became less, and she died fifty-six hours after the operation.

After death a partial post-mortem examination revealed the existence of a large quantity of coagulated blood between the peritoneum and abdominal muscles, this clot extending upwards to the umbilicus. The peritoneal cavity was found healthy, and the strangulated bowel was not to be discovered, death having evidently taken place from hæmorrhage. The post-mortem having been only partial, the wounded vessel was not made out.

These cases are given alone, any remark upon them are unnecessary; they speak for themselves.

CHAPTER XXIII.

ON STRANGULATED UMBILICAL HERNIA.

In an early page it was stated that in every 100 cases of hernia 5 were umbilical or ventral. In strangulated hernia my own tables told us that 6 per cent. were of this form, and also that of every 100 cases so strangulated 73 were reduced by the taxis and 27 by herniotomy; these cases requiring operative relief 9 per cent. less frequently than inguinal, and 46 per cent. less frequently than femoral. The fact that this form of hernia is more amenable to treatment by the taxis is a point of considerable interest, particularly when the fatal nature of the operation of herniotomy is observed, one case only in five recovering, or 20 per cent.

Analysis of the 18 examples I possess.

15 were umbilical, and 3 ventral.

10 were reduced by the taxis, 1 of which died.

5 ,, by operation, 4 ,,

Sex.—

9 were in females, all of which had borne children.

6 ,, males.

Period of its existence.

2 were recent, both being ventral.

1 case had existed 3 months.

6 ,, from 5 to 10 years.

1 ,, from 10 to 20 ,,

6 ,, from 20 to 40 ,,

2 ,, many years.

Umbilical hernia appears, therefore, to be little liable to strangulation on its first descent, many years, varying from five to forty-five passing away before such a result takes place.

Reduction by the Taxis.—One case only of the 10 reduced by the taxis proved fatal.

CASE 1.—*Umbilical hernia ; obstruction to the bowels from a sacculated adherent colon ; death.*

The case was as follows:—A woman, æt. 56, having had a hernia for many years, was suddenly seized some twenty-four hours before her admission under the care of Mr. Cock, with symptoms of strangulation. The taxis, under the influence of chloroform, proved successful, but collapse and death followed in twelve hours. After death, general peritonitis was found to have been present; the intestinal coils being all adherent. An umbilical omental hernia existed the size of a fist, the omentum forming a distinct sac, to the centre of which a piece of the transverse colon was firmly adherent, forming a kind of pouch. The colon was, however, tolerably free. The intestines above this point were distended, below contracted and empty. The cæcum was of an enormous size, almost filling the lower part of the abdomen; it was here that the tension had been experienced; it was black, and in places the peritoneal coat was fissured, leading one to believe that but little extra distension could have been borne without a rupture taking place.

The mucous membrane was also lacerated transversely, and the walls were so thin that they nearly ruptured in handling.

Remarks.—This case is one of remarkable interest. Death had doubtless been caused by the umbilical hernia, but not from its strangulation. Peritonitis was evidently the cause, resulting from a partially ruptured and over-distended cæcum; a condition of bowel apparently having been produced by the traction which had been exerted upon the transverse colon, resulting from the adhesion of its walls to the omental sac.

As elucidating a secondary result of hernia this case must be regarded as a most valuable one; illustrating a point which has not perhaps been sufficiently recognised, namely, the influence of adhesion of the bowel to a hernial sac or the abdominal walls upon the functions of the intestines. Doubtless such adhesions being sufficient to account for many of the griping and painful symptoms which exist in an old and irreducible hernia. The case just quoted must also be regarded as a good illustration of the result of a long-continued interference with the bowel's actions. The over-distension of the cæcum, with its attendant consequences, was apparently entirely due to the interference with its functions, resulting from the union of the walls of the transverse colon to the omental sac. The calibre of the colon itself was not materially diminished, but its power of acting had become paralysed; the greater the distension of the intestine above, the greater must have been the traction caused by the adhesion, and as a sequel, the greater was the effect of this interference; at last complete paralysis of the part had taken place, and complete obstruction; giving rise to all the symptoms and conditions which had terminated in death.

I imagine it to be quite possible that the smallest traction of a portion of the calibre of the intestine in a hernia, or otherwise, although accompanied with an open passage of the bowel, to be quite sufficient to interfere with the bowel's action, and even at last to cause complete obstruction. As an additional illustration of this opinion, the following case may be quoted, although it is one of femoral hernia.

CASE 2.—A woman, æt. 56, who had had a lump in the left groin for many years, which had never troubled her and had never disappeared, was seized nine days before admission with pain in the abdomen and vomiting; on the fourth day after the first appearance of the symptoms, under advice, an enema

was given with relief, but the vomiting continued. On the day of admission it became stercoraceous, and this induced her to come to Guy's. When admitted, under the care of Mr. Birkett, these symptoms were severe, but not the slightest local pain or tenderness was discernible. The abdomen also was flattened, and indeed concave, no signs of distension of the bowel being present. As these symptoms were those of hernia, an exploratory operation was performed over the tumour; and on cutting into it a piece of what was believed to have been old omentum was observed, and no intestine. The symptoms, however, continued, and the patient died on the sixteenth day.

After death the intestines about the pelvis were found glued together by recent lymph; above this point they were healthy. The omentum was found to be lying in front of the intestine, and did not descend lower than the crest of the ileum. Upon separating the intestines, a portion of bowel was found attached to the neck of the hernial sac on the left side.

Upon removing the sac with the intestine, it was seen that the mass which resembled omentum was a nodule of fat situated external to the peritoneum. The sac was very small, and within it, closely adherent from old adhesions, was a knuckle of bowel; a portion only of the calibre of intestine was within the sac, and this was very thin and perforated. The passage of the intestine was thus only partially obstructed, the strangulated piece being a kind of diverticulum.

Remarks.—This case, in every point, bears out the remarks which were appended to the last case. The traction produced by the adhesion of the intestine had so interfered with the bowel's action, that complete obstruction had taken place; the early symptoms were evidently those only of obstruction; but the cause continuing, a fatal peritonitis had taken place. The two cases together cannot but be regarded as of interest in pointing out the results of adhesion of the intestine, and showing how death from hernia may take place, although not from its strangulation. The traction, also, of an omental hernia upon the colon must have a like, although, perhaps, a less powerful action; but is sufficient in many cases to account for symptoms which might otherwise appear inexplicable.

The four fatal examples after herniotomy were in patients who had been the subjects of hernia for sixteen years and

upwards ; in all, peritonitis was the cause of death ; the hernia having been large, and relieved by opening the sac.

CASE 3.—The successful case was in a woman æt. 74, who was admitted under my care with a large hernia of five years' duration, and with symptoms of strangulation for six days. Violent taxis had been employed, but had failed ; under chloroform herniotomy was performed, the sac being opened only at its neck, and not sufficiently to sec or to allow of manipulation of the intestine. On the fifth day the bowels were spontaneously relieved, and convalescence followed.

Remarks.—The fact that no manipulation of the intestine had taken place in this case appears sufficient to account for its successful termination. In umbilical hernia it is a difficult thing to operate without opening the sac, most cases requiring such a practice ; in the case quoted the sac was opened only at the neck, to allow of the introduction of a director and the division of the line of stricture. The intestines were therefore left untouched, and this is a point of considerable importance. The rarity of success following the operation of herniotomy in this form of hernia is doubtless to be attributed to the exposure and injury done to the strangulated bowels by the manipulative efforts of the surgeon to prevent its return ; if, then, by the simple operation of opening the neck of the sac sufficiently to allow of the division of the line of stricture without exposing or fingering the bowel a better result can be secured, such a practice should when possible undoubtedly be carried out.

Three of the cases of ventral hernia present no peculiar points of interest.

CASE 4.—The fourth was in a man æt. 54, who was admitted under my care, having fallen a height of twenty feet upon the handle of a pump. An enormous hernia, the size of a hand, rapidly appeared over the right iliac fossa, an extensive rupture of the abdominal muscles having taken place. Sickness and vomiting also were present. The taxis carefully applied relieved these symptoms, and reduced the hernia partially ; ice was applied locally and opium given internally, with considerable benefit. No bad symptoms subsequently appeared, the man leaving the hospital with a firm pad and bandage so applied as to support the part.

CHAPTER XXIV.

A GENERAL SUMMARY, WITH DEDUCTIONS.

Table illustrating the various points elucidated in the previous pages, expressed in per-centages.

	Fre- quency of occu- rence.	Per- centage strangu- lated.	Reduced by Taxis.		Reduced by <i>Herniotomy</i> .		Sac opened.		Sac <i>not</i> opened.		Mortality of whole number strangu- lated.
			Per- centage.	Mortality.	Per- centage.	Mortality.	Per- centage.	Mortality.	Per- centage.	Mortality.	
Inguinal	84	50	64	3·8	36	52	80	60	20	22	21
Congenital		24	57	0	43	38	84	45	15	0	17
Recent ...		5·7	28	0	72	100	80	100	20	100	71
Old		70	70	5	30	50	77	60	23	16	19
Femoral	10	44	27	10·5	73	42	56	50	43	30	33
Recent ...		21	32	0	68	66	38	87	62	54	45
Old		78	25	4	75	36	62	45	38	22	30
Umbilical ...	5	6	73	10	27	80					27

The table just given has been drawn up to illustrate the

various points which have been elucidated in the previous pages; and it is impossible for any surgeon to consider it with care without being struck with the many interesting and important facts which it brings before us.

In the former pages, the several questions concerning the three principal forms of hernia have been fully diseussed; in the present, I propose briefly to consider the differences between them, and to pass on to make such practical remarks as my material may appear to warrant. For the sake of brevity and clearness, I propose to carry out these intentions by drawing up such deductions as the facts may justify.

DEDUCTIONS DEMONSTRATED BY THE PREVIOUS TABLE.

On Inguinal Hernia.

1. That it is more common than femoral by 74 per cent., and is far less liable to strangulation.

2. That it rarely becomes strangulated on its first descent; that 24 per cent., at least, are of the congenital form; the remainder being of many years' duration.

3. That when strangulated, it is more frequently relieved by the taxis than femoral hernia; these means succeeding in about two thirds of the cases, whilst in femoral it hardly reduces one third.

4. That the taxis is most successful in cases of "old" hernia, less so in "congenital," and least of all in the "recent;" and that a fatal result follows its use in about 5 per cent., the cases generally belonging to the class of "old" hernia.

5. That the taxis is not only more successful in its immediate effects but is less fatal than in the same class of cases in femoral hernia in the proportion of 5 to 14 per cent.

6. That herniotomy is more fatal than in femoral hernia—that in "recent" cases a fatal termination is the rule; in "old" about 50 per cent. die, and in the "congenital" form about 38 per cent.

7. That when the *sac is opened*, which appears to be necessary in about four fifths of the cases, death takes place in about 60 per cent. The "congenital" form of hernia showing the most favorable results.

8. That when the *sac* is *not opened*, which is the case in about 20 per cent. of the cases operated on, the death rate sinks from 60 per cent. to 22; the congenital form here being the most favorable, and in old hernia the mortality sinks to only 16 per cent., or less than one in six.

9. That a strangulated "*recent*" inguinal hernia is rarely reduced by the taxis, more than two thirds requiring herniotomy, and that a successful result is a rare occurrence.

10. That the "*congenital*" form, when strangulated, is successfully treated in more than half the cases by the taxis, and that a fatal result of such treatment is very rare.

11. That in the "*congenital*" form the operation of herniotomy is more successful than in the "*recent*" or "*old*;" 38 per cent. of these cases dying, against 50 per cent. of the "*old*."

12. That in the "*old*" hernia at least 70 per cent. are reducible by the taxis, 5 per cent. proving fatal.

13. That in the "*old*," herniotomy is fatal in about half the cases; that when the *sac* is opened 60 per cent. die, and when left unopened only 16 per cent.

14. That in inguinal hernia as a whole, when the *sac* is opened the operation of herniotomy is far more fatal than when it is not; the difference being at least 40 per cent.

Deductions on Femoral Hernia.

1. That it forms but 10 per cent. of the cases of hernia; but 44 per cent. of the cases strangulated; femoral hernia being far more liable to strangulation than inguinal.

2. That when strangulated, at least 20 per cent. are of "*recent*" origin, that is, are strangulated on their first descent.

3. That when strangulated, the reduction by the taxis is far less successful than in inguinal hernia by nearly 40 per cent., and the taxis is also far more fatal.

4. That the taxis is most successful in "*recent*" cases, and the least so in "*old*," one in three of the former, and one only in four of the latter, being reduced by such means, and 14 per cent. of these old cases are fatal.

5. That herniotomy is less fatal than in inguinal, by at

least 10 per cent. That in "recent" cases 66 per cent. die, and in "old" only 36 per cent.

6. That when the *sac is opened* the mortality is 20 per cent. greater, the difference ranging between 50 and 30 per cent.

7. That in "*recent hernia*" the sac is opened in only 38 per cent. of the cases, and left unopened in 62 per cent.; the death rate falling from 87 per cent. in the former cases, to 54 per cent. in the latter.

8. That in "old" hernia the sac is opened in 62 per cent., and left unopened in 38, being exactly the reverse of the "recent." The death rate falling from 45 per cent. in the former, to 22 per cent. in the latter.

9. That "*recent cases*" of strangulated femoral, treated by herniotomy, are at least twice as fatal as "old;" that the sac is not required to be opened in the majority of such cases, and that, in these the mortality is less by 33 per cent.

10. That "*old*" cases of strangulated femoral, treated by herniotomy, are half as fatal as the recent; that when the sac is opened they are twice as fatal as when it is not opened, the death rate in the latter being but 22 per cent.

Deductions on Umbilical Hernia.

1. That it forms but 5 per cent. of the cases of hernia, and 6 per cent. of the cases strangulated.

2. That 73 per cent. of the cases strangulated are reducible by the taxis, 10 per cent. proving fatal.

3. That 27 per cent. are reducible by herniotomy, 80 per cent. dying.

The absolute necessity of dividing the "recent" from the "old" cases of strangulated hernia, whether of inguinal or femoral, can hardly be doubted by any one who will carefully study the figures given in the previous pages; in almost every point of comparison they differ. The most prominent fact being the much greater mortality of the "recent cases."

In the "recent cases" the reduction by the taxis is more favorable than in the old, both in femoral and inguinal, a fatal result not being recorded. The taxis also reduces a larger number of recent femoral than of inguinal hernia.

In "old" strangulated inguinal hernia the taxis reduces about 70 per cent. of the cases, whilst of femoral but 25 per cent. are treated with success; the mortality also of the latter is much greater. These facts, whilst encouraging the hope of reduction of an old inguinal by the taxis, points definitely to the necessity of greater care in its application in strangulated "old" femoral hernia; the death rate, after the reduction by the taxis of these cases, being 14 per cent.; whilst the death rate after herniotomy without opening the sac, of the femoral, is only 22 per cent.; if these cases were therefore all treated by operation, the sac not being opened, there is fair reason to believe that whilst the mortality after the taxis would disappear, that of the operation would likewise be considerably lessened.

On comparing the two classes of cases, recent and old, when treated by herniotomy, the difference becomes still more apparent; in both inguinal and femoral hernia the "recent" cases being twice as fatal as the "old." In both forms of hernia the majority of the "recent" cases require herniotomy; nearly all of the inguinal and 66 per cent. of the femoral proving fatal.

In the "old" cases of inguinal, hardly one third require herniotomy, 50 per cent. of these dying; in the "old" of femoral three fourths require operation, the death rate being 36 per cent. In "old" inguinal cases, therefore, whilst there is strong reason to believe that the taxis will succeed, especially if chloroform be used, the operation of herniotomy is not half as fatal as in the "recent" cases.

Whilst in "old" femoral hernia, the taxis being rarely successful, it becomes a question whether it would not be better not to try it, as herniotomy can be resorted to with hope; this operation being half as fatal as it is in the "recent" cases, about one case in three terminating in death.

CHAPTER XXV.

ON OPENING OR NOT OPENING THE SAC, WITH PRACTICAL CONCLUSIONS.

It cannot be doubted that the material just analysed, must possess some influence in settling the question which has been so

freely discussed; namely, the propriety of opening or not opening the sac; and if there is any force or truth in the facts which have been adduced, there is also no question that the line of practice which appears to be most successful is the one in which the sac is left unopened.

Taking the cases of inguinal hernia in which herniotomy was required, death took place in 60 per cent. of the cases in which the sac was opened, and in 22 per cent. only in which it was left alone; the difference being nearly 40 per cent.; the cases in which the sac was opened being nearly three times as fatal as were those in which it was left untouched. In femoral hernia the same conclusion appears to be equally manifest, the death rate in the two cases differing 20 per cent. When the sac was opened, the mortality being 50 per cent., and when left unopened only 30 per cent. If, however, in the cases as a whole, this conclusion is tolerably clear, when the division of the cases into the "recent" and "old" is made, it becomes still more prominent, and the value of the minor operation stands out more boldly. In strangulated "recent" inguinal hernia, the difference in the operation does not appear to have much influence, a fatal result too frequently takes place in both. But in the cases of strangulated "old" inguinal hernia, the difference is immense, the death rate descending from 60 per cent. when the sac is opened, to 16 per cent. when it is left untouched; the difference being 44 per cent., or nearly four times as great; and in congenital hernia the practice is equally beneficial. In femoral hernia the same conclusions are apparent. In "recent" cases, when the sac is opened, the mortality is 87 per cent., and when unopened but 54 per cent. In "old" cases, where the contents of the sac were exposed, the mortality was 45 per cent., and when not, but 22 per cent.; the mortality in the former being twice as great.

These facts appear strong, and argue all one way, and that is against the practice which demands more to be done in an operation than is absolutely essential; it may, I think, be certainly said that in all cases of inguinal, femoral, or umbilical, recent, old, or congenital—the cases are more successful when the sac is not opened, and, as a consequence, the surgeon is hardly justified in taking an unnecessary step by opening the sac when no benefit but some harm appears to result.

It may be a satisfactory thing on the part of the surgeon to know the condition of the hernial contents, but practically such knowledge is of little use; and unless it can be proved that such an inspection is of any value, the opening of the sac must be regarded as unnecessary.

In another place,¹ it was fairly shown that in no single fatal case could the opening of the sac have had the slightest influence in retarding or preventing the fatal result. Thus the dead, by a negative argument, aid in recommending the minor operation. The tables given certainly argue in favour of not opening the sac, and the fatal cases told also the same tale; the conclusion therefore remains to be drawn, that if no good result can be shown to take place by the opening of the sac that death is more common, and cannot be retarded or prevented by such a practice—the rule for the operator should be to attempt the lesser operation, feeling that if that fails he can always resort to the major measure.

Many of the advocates for opening the sac confess that in a large inguinal hernia, and in umbilical, the danger to life mainly depends upon the amount of manipulation that the exposed strangulated bowel undergoes, and even express an opinion that in these cases the practice of opening the sac is to be condemned. In cases of femoral the same injury must certainly take place, and although the bowel is, as a rule, less in extent, the evil must be the same in kind, although perhaps less in degree. In surgery, the rule for the operation is surely this, that no step should be taken unless an absolute necessity exists; that is, unless some positive advantage can be obtained. In opening the sac, in all cases of strangulated hernia, this positive good is still undeclared; and as the weight of evidence tends to the opposite line of practice, it must be condemned.

PRACTICAL CONCLUSIONS.

The careful consideration of the pages which have just been concluded have naturally some positive tendency in fixing or indicating the practice which is to be adopted in the treatment of strangulated hernia.

In inguinal hernia.—In the inguinal, the fact which appears

¹ 'Guy's Hospital Reports,' 1856.

to be most prominent is the success which follows the cautious application of the taxis; and if that taxis is employed under the influence of chloroform, very general success may reasonably be expected. In the earliest hours of strangulation, success may follow the taxis without such means; but if many hours have passed away, and the symptoms of strangulation are manifest, chloroform should be employed. Baths, opium, and ice have been shown to be unnecessary, although in former times they have been most serviceable. But as all the advantages which these means afford are embodied in the use of chloroform, and all the evils of their use have been dispensed with, the primary employment of the means which has been so beneficial cannot be doubted. In cases, therefore, which have been strangulated many hours, let chloroform be at once administered; and when the patient has been fully brought under its influence, the taxis should be resorted to; the surgeon applying it with the confidence conferred by the knowledge that, in extreme instances, success has followed its use when all other means had failed, and with the reasonable hope that in less severe cases success must follow. I am so far impressed with the value of this agent in reducing a strangulated inguinal hernia, that I believe there are few cases in which success will not be obtained, if the patient is brought completely under the influence of the anæsthetic, and the taxis is fairly applied. The force required to reduce an inguinal hernia under the influence of this anæsthetic is comparatively nothing, the gentlest manipulation proving sufficient. In an earlier page it has been shown that, by its use, in at least 20 per cent. of the cases reduced by the taxis success had been obtained when all other means had been attempted and had failed; and, with this success, it is not unfair to believe that in other cases less severe a greater one can be secured.

In the strangulation of "recent" inguinal hernia, the extreme fatality of the operation of herniotomy renders the necessity of its reduction by the taxis more urgent; and the fact, that a fatal instance after reduction under the influence of chloroform is not recorded, is an encouragement to its use. In "old" hernia, also, the fact that a large proportion of its cases are successfully treated by the taxis renders this treatment by chloroform more valuable, as it raises our expectation

that the cases for operation may be diminished, and that few will require herniotomy.

If herniotomy is required, what operation, therefore, should be selected? The tale told in a previous page is tolerably clear; operate, if possible, without opening the sac. The difference of mortality between the two cases has been shown to be great (50 per cent.); and although it is true that in a large proportion of the cases the sac is required to be opened to allow of the reduction of its contents, that point tells nothing against the practice which advises primarily the minor operation.

The largest proportion of strangulated inguinal hernia being of the "old" kind, that is, taking place in subjects who have had a rupture for twenty or more years, may perhaps explain the fact that so many cases are irreducible without opening the sac. In these instances the omentum is, as a rule, down and adherent, the strangulated intestine being generally situated behind or within an omental sac. In such cases, it is not difficult to understand how it is necessary to expose the parts, and to unravel them, to allow of the reduction of the strangulated bowel.

Treatment of strangulated femoral hernia.—In the treatment of inguinal hernia, it has been already stated, that the hope with which the surgeon proceeds to reduce the tumour by the taxis is very great, and that it becomes greater when the patient has been brought under the full influence of chloroform. Indeed, it has been written that there are few cases which are believed to be incapable of reduction by such means. In the treatment of strangulated femoral hernia a very different tale has to be told: but few cases are reducible by the taxis, and the mortality of these is very great. The use of chloroform in such instances also cannot be so highly recommended. The taxis, as a means of reducing a strangulated femoral hernia must be looked upon with considerable suspicion, and indeed I believe that treatment to be only applicable to a small class of cases.

In the strangulation of a "recent" femoral hernia it has been shown to be the most successful, a larger number of these cases being capable of reduction by the taxis, and with a less fatal result than in the "old." The great mortality also of these "recent" cases after herniotomy renders the treatment by the taxis of greater value, and increases our anxiety to reduce the tumour without an operation.

In strangulated "old" femoral hernia, but few cases have been shown to be successfully treated by the taxis, and of these the mortality is very great; the operation of herniotomy is also less fatal; it becomes therefore a question whether it would not be better to put aside the taxis altogether in those cases, and operate at once, than run the risk of injuring the strangulated bowel by the taxis. The danger of the taxis in femoral hernia is always great, and the greatest caution should be employed in its application. Violence cannot be too strongly reprehended. The mortality of the cases after reduction helps to enforce this fact, and to insist upon the moderation with which it should be applied.

In the early hours of a strangulated femoral hernia, and more particularly in "recent" cases, the taxis may be employed, but this only with extreme caution and moderation, a few minutes only being sufficient if success is to be obtained; a longer continued period of pressure must do harm.

If many hours have elapsed after strangulation, and the case is of an "old" character, the taxis must be dispensed with, or at any rate employed but gently when the patient has been brought under the influence of chloroform preparatory to an operation. In some few cases it may then succeed; but the hope of success is but slight.

When herniotomy is required, the operation without opening the sac appears to be the most successful, a difference of 20 per cent. existing between the two classes of cases. In strangulated "recent" examples, this difference becomes greater, the majority of the cases being relieved by this operation; the mortality sinking from 87 to 54 per cent. In strangulated "old hernia" the same practice is indicated, the mortality in the cases in which the sac is opened being 45 per cent., and when not opened only 22 per cent. The operation of not opening the sac is thus clearly the most successful, and should be carried out whenever applicable.

The not opening of the sac is the chief point to be attended to. If the hernia can be reduced without opening the fascia propria, as suggested by Mr. Gay, and recommended by Mr. Birkett in his 'minimum' operation, so much the better; but I imagine the difference of a layer of fascia more or less can have no influence on the result of an operation, unless it be

to expose the hernial contents. The object is not to expose or to manipulate an injured and probably an inflamed bowel; and, carrying out this principle, the line of incision, or its depth, may be left to the fancy or discretion of the operator.

Umbilical hernia.—In this variety, the same principles of treatment which should influence our practice in the former cases appear applicable. Reduction by the taxis is on the whole successful, and in obstinate cases the use of chloroform should be employed. When herniotomy is required, if the hernia can be returned without opening the sac, the attempt should be made, the mortality of these cases after operation, as a rule, being very great; indeed, the only successful example which I have quoted is the one in which the contents of the sac had not been exposed. If this is impossible, the practice followed in the case quoted might be followed, namely, the opening of the neck of the sac just sufficiently far to allow of the division of the stricture, but not the exposure of the hernial contents. By such means the real danger of opening the sac, namely, the exposure and manipulation of the inflamed bowel, is done away with, and a greater success may consequently be anticipated. In all cases, however, the not opening the sac would appear to be the best; and I am at a loss to know a single reason why this rule should not be carried out. When reduction without exposing the interior of the sac cannot be effected, the sac must be opened; but such a step must be regarded as an evil, and as being unnecessary if reduction can be effected without it.

After-treatment.—On the after-treatment of hernia, a few words may not be without their use. The object of the surgeon is unquestionably best carried out by preserving rest of the injured or inflamed parts, and thus allow the reparative power of nature to effect a cure; opium, given in moderate doses, is therefore indicated. It has become a question of late years whether this opium treatment has not been carried too far by surgeons, and whether by giving large doses of this drug nature's processes are not retarded. Moderate doses therefore should be given, these being regulated according to the severity of the cases. In the simplest and most recent examples, a grain after the operation, and half a grain repeated every four or six hours, may be all that is required; in others in which peritoneal

inflammation appears severe, one grain at the same intervals may be administered. These opiates may be omitted as soon as all fear or symptoms of peritoneal inflammation has subsided, their continued administration tending too much to lock up the bowels.

Respecting purgatives, there are few, if any, cases in which they should be employed. In another place¹ I have, as clearly as I could, pointed out how groundless are the fears of the surgeon at the constipation which follows the reduction of a strangulated bowel; and I quoted many instances to show that ten, twelve, and even twenty-three days may elapse without any action of the bowels taking place, and without any ill effects. I have also attempted to show, by correct principles, that this repose of the bowel functions was really wanted; and that as soon as the injury it had sustained had been repaired, the normal functions of the intestines would return, and an evacuation follow.

Purgatives, therefore, should not be given. Days may pass without any action taking place, without fear; and indeed no means to hasten their action should be employed, unless symptoms evidently resulting from the constipation are produced; the mildest treatment will then suffice — a simple enema or a small dose of olive or castor oil being, as a rule, quite sufficient. Other complications must be treated by correct principles, opium unquestionably being the best remedy in the peritoneal.

Since the preceding papers have been penned, a valuable analysis of cases from St. George's Hospital has been published by Messrs. Holmes and Cooper, in the 'Medical Times and Gazette' for June 15th, 1861. I should have been glad to have compared, as far as I could, the various points as indicated by their and my own materials, but space forbids my carrying out these intentions. I can only refer my readers to the original, and express a hope that others will follow their example.

¹ 'Transactions of the London Medical Society,' 1860-61.

CHAPTER XXVI.

ON ANAL ABSCESS, AND FISTULA IN ANO.

The two subjects of anal abscess and fistula in ano are classed together, as the latter disease is almost always preceded by the former, although it is equally true that a large number of cases of anal abscess get well without passing into a fistula. I possess the notes of 236 cases of the two diseases. Forty-three commenced and ended as anal abscess, the remaining 193 being treated as fistula in ano. Seventy-four of these cases were in females, and 162 in males, men being evidently more liable to this affection than women.

Of the causes of this disease little positive information can be given. The abscess, in the majority of cases, began without any evident cause, and careful questioning generally failed in obtaining definite information upon the point. As a rule, the abscess is obscure in its origin, insidious in its progress, and slow in its repair; some patients even professing to have been quite unconscious of its existence till it was about to burst.

That a fistula in ano, and consequently an abscess, must always depend upon and be the result of an ulceration of the bowel within the sphincter is an opinion which can hardly be regarded as true. The fact that there is no evidence to support such an opinion, and that so many instances as forty-three of anal abscess should have recovered without forming a fistula, tend much to prove its error; for it can hardly be believed that an anal abscess, the result of a perforated bowel, should recover as soon as an external outlet has been obtained; and if so many cases of this disease are capable of repair as are tabulated in the preceding page, it is not unfair to infer that they depend upon a different cause.

In fistula in ano this argument must be equally strong, for it is generally believed that this affection is merely the sequel of the anal abscess; we must therefore look for some other and more general cause than the one ordinarily received, namely, perforation of the bowel from ulceration, whether that

ulceration depend upon the softening down of what is called strumous deposit, or other causes.

I possess the notes of but two cases in which any cause could be obtained.

CASE.—One was in a man, *æt.* 60, who five days before admission was attacked with abscess near the rectum. He had been breakfasting the day previously upon herrings, and the man asserted that when the abscess broke a fish-bone came away. A few days after admission under the care of Mr. Cook, the wound healed, and he rapidly recovered.

CASE.—The second was in a child, aged fifteen months, who for five weeks had suffered from irritation of the bowels, and three weeks before admission under the care of Mr. Hilton an anal abscess had formed and burst. On opening the sinus a piece of bone came away, apparently a fish-bone or tooth of a comb. Convalescence followed.

These two cases are the only examples out of 236 in which any cause could be assigned. In the first, the evidence rested only upon the patient; in the second, there could have been no doubt. The rapid course of the disease, and recovery after the removal of the supposed source of irritation in both instances, is a fair argument that the assigned cause was a correct one.

Age.—

	Total.		
Under 10 years of age	. 4 cases.	2 males.	2 females.
Between 10 and 20 years of age	. 19 "	11 "	8 "
" 20 " 30 "	. 88 "	51 "	37 "
" 30 " 40 "	. 57 "	45 "	12 "
" 40 " 50 "	. 36 "	25 "	13 "
" 50 " 60 "	. 20 "	18 "	2 "
" 60 " 70 "	. 8 "	8 "	— "

One of the cases which occurred in children has been already quoted.

The second was in a girl, aged twenty months, who had suffered from fistula for two weeks. Mr. Cooper Forster divided the fistula, and the child recovered.

The other two cases were in children six or seven years of

age. The majority of instances evidently most frequently occur in adults between twenty and thirty years of age. In men, however, as many cases occur between thirty and forty. In women the former period is the most frequent.

Duration of the disease.—

Under 1 year	.	.	83 cases.
Between 1 and 2 years	:	.	33 "
" 2 " 3 "	.	.	25 "
" 3 " 4 "	.	.	10 "
" 4 " 5 "	.	.	8 "
" 5 " 6 "	.	.	7 "
" 6 " 7 "	.	.	1 "
" 7 " 8 "	.	.	3 "
" 8 " 9 "	.	.	5 "
" 9 " 10 "	.	.	2 "

Two had existed eleven years, two fifteen, and two sixteen and twenty years respectively.

Thus one sixth of the cases existed upwards of four years, a second sixth between two and four, and a third between one and two years, one half existing only the period of months.

Treatment.—In the cases of anal abscess which had not opened prior to admission, relief was in the majority of cases given by the introduction of a bistoury. The bowels should be previously relieved by an enema or a small dose of castor oil, and subsequently kept at rest by a gentle opiate. The incision should be tolerably free, so as to admit of the easy escape of the abscess's contents, and also to ensure the closure of its walls, and thus the prevention of a fistula.

In rare cases inflammatory engorgements in this ischio-rectal fossa disappear without suppurating. I have the notes of one such case in a woman aged nineteen, who for three weeks had been suffering from all the general and local symptoms of an anal abscess, and when admitted its suppuration and discharge appeared certain. By rest in bed, however, it all gradually disappeared, and she left the hospital cured.

In the treatment of fistula but one operation appears to be of benefit, and that is the division of the sphincter. It is clearly unnecessary to lay open the whole sinus; such a practice is not sound in theory, nor is it found to be practically called for.

The internal opening, as a rule, is merely within the sphincter, and the division of the sinus up to that point is all that is required.

In some rare cases of fistula an internal or external opening alone may exist. I have, however, but one illustration of each of these forms out of the many cases (193) which I possess, showing that, although they may occur, they are very rare.

One example of blind internal fistula was in a man, æt. 19, who for two years had suffered from an anal abscess discharging into the rectum. An external opening was made, and the sphincter divided, convalescence rapidly following.

The only example also of blind external fistula occurred in a man, æt. 58, a patient of Mr. Cock's, who for a few months had been troubled with a fistula following the rupture of an anal abscess, which had been forming for seven months previously. No communication with the rectum could be detected, although the sinus was freely injected with milk in order to determine accurately the point. The external opening was a small one. This was accordingly enlarged, and the abscess filled with lint, a cure rapidly resulting.

These two cases, and the treatment which proved successful in each, illustrate the two different forms of so-called fistula, and the treatment which should be pursued.

In the blind internal fistula there can be no question that the formation of an external outlet, and the division of the sphincter, is an essential point; although it is not so clear that the opening of the wall of the abscess into the rectum is always required in the so-called blind external. That such a condition may take place the last case quoted fairly proves, although, without doubt, in the majority of instances of blind external an internal opening will be found, if looked for.

In the majority of cases of fistula the division of the sphincter is the best practice, although some surgeons recommend a different one. The injection of the sinus has been attempted in but a few of the cases before me, and its success also was not great. I have no example to quote in which a cure by ligature was attempted.

The free evacuation of the bowel before the operation, and its rest produced by an opiate afterwards, the horizontal position being maintained, are the only points to be alluded to.

The best plan to divide the sphincter is with a bistoury passed upon a director through the internal opening, having previously passed a speculum with a valve to allow of a careful examination, and to ensure the free section of the sphincter. These cases are generally most successful, but few really failing.

As to the connection between phthisis and fistula, it is difficult to give any very positive information. It is a point into which I have invariably inquired, in taking the notes of the cases before me; but I have only three cases amongst the 193 in which either hæmoptysis has been present, or in which any other general symptoms of pneumonic phthisis existed. In the majority of cases the patients presented no more severe cachectic symptoms than exist in any other class of hospital patients, and I confess to being somewhat doubtful as to the fact that fistula is a common associate with phthisical disease.

CHAPTER XXVII.

ON HÆMORRHOIDS, OR VASCULAR TUMOURS OF THE RECTUM.

Preserving the word hæmorrhoid as one generally well recognised, and employed by surgeons to describe at least two conditions of the lower bowel in which hæmorrhage is the chief symptom, I have added the heading of vascular tumours of the rectum as being pathologically more correct.

If the external hæmorrhoid is now generally believed to be a simple varicose condition of the veins of the part, it is also now equally believed to be true that internal hæmorrhoids are of a totally different character, and consist essentially of a new vascular growth closely allied to nævoid structure. Other cases also are found in practice of apparently a compound nature, having the characters of both forms. I have divided, therefore, my sixty-one cases into the external, internal, and combined forms, these three headings including all the varieties found in practice.

19 were external, 8 being in men, and 11 in women.

31 „ internal, 18 „ 13 „

11 „ combined, 6 „ 5 „

It would thus appear that the internal are the most common, and that the disease is as frequent in men as in women.

Age of patients.—Respecting the different ages at which the disease is most prone to take place, the following table will be found of interest:

	Under 20.	Between 20 and 30.	Between 30 and 40.	Between 40 and 50.	Between 50 and 60.
Men . . .	—	5	7	12	8
Women . .	2	11	7	8	1
	—	—	—	—	—
	2	16	14	20	9

It would thus appear that in early adult and middle ages this disease is most frequent, and that in women it is found more frequently in early adult life.

Treatment.—In a large variety of the cases of so-called hæmorrhoids the palliative treatment is all that is required; the cases, however, admitted into a hospital are generally of a graver nature, and in these more active surgical treatment is, as a rule, called for. In many patients hæmorrhoids are only local symptoms of some general derangement; in these cases the constitutional disease is the most important, and medical skill must then be directed to correct what is wrong, and thus, by removing the cause of the disease, cure it. In the largest proportion of cases, however, some derangement of the liver's functions, and constipation, are the chief causes. In private practice these conditions may generally be relieved by attention to the various causes which are found to have an influence in producing them, such as high feeding, sedentary habits, and neglect of the bowels' functions. In hospital practice the same causes may exist; and when they can be corrected, which is unfortunately seldom, benefit will be experienced. To stimulate the liver's action, small doses of blue pill prove decidedly of value, the best pill consisting of one grain of the Pill. Hydrargyri, and three of the extract of conium, twice a day, and the Mist. Olei of the Guy's Pharmacopœia; low diet and rest in the horizontal posture being essential points. In cases of greater severity this palliative treatment is not sufficient; it was found, however, to have answered in twenty-three instances out of the sixty-one.

To cure an external hæmorrhoid, excision is unquestionably the best treatment, the removal of the varicose tumour being

ensured either by the knife or scissors; a gentle purgative before the operation, and rest afterwards, being all that is required. In seventeen out of the eighteen cases tabulated this treatment was successful. In internal hæmorrhoids other treatment is to be employed, excision being quite out of the question; ligaturing and the application of an acid, such as the nitric, being the most valuable. These two methods of treating internal piles are not, however, applicable to the same cases; both are of great value in special instances, but discrimination is required in the choice.

In the cases of internal piles in which some portion only of the bowel's circumference appears to be involved, and in which a distinct nodule of vascular growth is readily protruded and observed, the application of a ligature appears to be the best practice. In nine instances before me this practice was carried out, and in all with a good result. In other cases in which the vascular growth involves the rectum more generally, that is, when the whole inner circumference of the bowel appears to be the seat of a diffused vascular turgescence, and in which it would be almost impossible to apply a ligature, the free application of the nitric acid is of immense value. It should be done without hesitation, and without fear, the object is to destroy entirely, and, if possible, by one application, the whole of the diseased growth; and if done with care, the danger attending its application is very slight. In seven instances this practice proved successful, no bad result having to be recorded. In three other cases which were successfully treated, the actual cautery was employed. I am not aware that this mode of destroying the tumour has any peculiar advantages over the application of the acid. It is applicable in the same class of cases, and from the three instances before me has been proved to be of value. Nevertheless, it has the disadvantage of being somewhat repulsive to the mind; and not knowing it to be of greater usefulness than the nitric-acid treatment, is not recommended.

In all these cases the bowels should be well relieved prior to operation, a good purgative the night previously, and an enema on the morning of the day, being the best practice.

The next thing for the surgeon to ensure is the projection of the tumour, and thus by a full view of it as a whole to

guarantee its total destruction. This can only be obtained by the patient sitting over hot water, and forcibly bearing down. This process is by no means free from pain; but if its object and necessity is previously thoroughly explained to the patient, the end will be obtained. If the hæmorrhoid is only partial, a valvular speculum will often answer every purpose, thoroughly exposing the whole growth. A piece of stick, or glass brush, are the best means for the application of the acid, which should be done freely, the parts around having been protected by a coating of oil, and some alkali being at hand to neutralize any acid which may trickle down. The bowels should subsequently be kept at rest for several days by opium; low diet and repose in the horizontal position being essential. In this, as in all other affections of the rectum, the patient will derive much comfort from the habit of seeking relief of the bowels at night, just previously to retiring to rest.

CHAPTER XXVIII.

ON PROLAPSUS RECTI.

To illustrate the whole subject of prolapsus recti would require the quotation of cases including every form of affection, local and general, which is accompanied with straining; almost every form of disease of the lower bowel, hæmorrhoids, polypus, and ulcer; diarrhœa, dysentery, and the presence of worms; almost all disorders of the urinary organs, especially in children, whether that disease is in the penis from adherent prepuce, in the bladder as stone, or in the urethra; and in other general conditions which are accompanied by straining, such as hooping-cough and constipation. In adult life, however, constipation is the most common; and in younger patients, the presence of worms and some irritation of the urinary organs. In the majority of cases of so-called prolapsus recti, there can be no doubt that the projection is only of the mucous membrane; but in some rare and extreme instances the whole bowel appears to be forced downwards, forming indeed a form

of intus-susception. In weak and cachectic subjects, all these causes act more powerfully ; and, as a consequence, it is in such that they are more likely to be followed by this result.

As an illustration of constipation as a cause, I have the notes of a child, aged sixteen, who for five years had been the subject of a prolapsus recti whenever any action of the bowels took place, this action being seldom under five, six, or seven days.

A second, in which a small ulcer of the anus within the sphincter had been the cause in a woman, aged thirty-two, the disease had existed five months. The ulcer being treated and cured, recovery followed.

A third severe case was in a child, aged ten, the prolapsus taking place as a result of ascarides. A powerful purge expelled an enormous mass, and convalescence was established.

To quote examples of this disease as resulting from urinary irritation must be unnecessary ; but, in all cases taking place in children, every surgeon should have his attention drawn to this quarter, an adherent prepuce or stone being the most common cause. Nevertheless, cases do occasionally take place in which no very evident cause can be assigned. I possess the notes of nine such instances ; in all, more or less constipation was present ; and probably this condition, accompanied with a general want of power, was quite sufficient. Rest in the horizontal posture, tonics, and gentle aperients in most afforded relief. In two instances of adults, in which the disease had existed three and nine years respectively, a cure was obtained by the application of the nitric acid in the same way as was advised in the treatment of so-called internal piles. And in one child, aged ten, an astringent enema proved of great benefit. In all cases the secretions were attended to, and all causes which might possibly have had an influence in producing the disease removed.

As a rule, this prolapsus is merely a symptom of some local or general disease, and success in its treatment must mainly depend upon the diagnosis and the treatment of the malady from which it proceeds.

CHAPTER XXIX.

ON PAINFUL ULCER OF THE RECTUM.

If the importance of any disease depended upon the amount of pain with which it is associated, an ulcer at the orifice of the anus, or lower portion of the rectum, would be regarded with immense interest; for I imagine that there are few local affections which excite so much misery, and which are attended with equal pain.

In a large proportion of cases this disease has usually existed many months, or even years, before advice is sought; and as it appears to be most common in women, motives of delicacy may be the cause of the delay. Amongst my notes, I possess sixteen examples of this disease, ten were in women and six in men, twelve of them had existed the period of six months, and four, 2, $2\frac{1}{2}$, 3, and 6 years, respectively. From these cases it would also appear that it is most common in early life: in eleven examples it occurred in patients between twenty and thirty years of age, and in five between thirty and forty.

It is difficult to arrive at any definite conclusion as to its cause. Constipation and want of cleanliness appear to be its common associates; but what influence they may have in exciting this affection it is difficult to decide. The chief symptom which usually first attracts the notice of the patient is pain in the act of defecation, lasting for some time—even for hours. If the motions are examined, a small streak of blood may occasionally be observed; and at times the spasmodic contraction of the sphincter may be so great as to produce a flattened or narrow motion. If the anus be at this time carefully examined, an ulcer may be detected, either upon its verge or just within the sphincter. On attempting to pass the finger or speculum up the rectum, the pain will be considerably aggravated, and some force may be required to overcome the spasmodic action of the sphincter ani. The ulcer, when detected, is seldom of any size; it is generally situated at the posterior part of the bowel, and its long diameter is also most frequently vertical.

Treatment.—Happily for our patients, the treatment of this disease is as successful as it is simple. When diagnosed, and the ulcer is external, the application of the nitrate of silver, and cleanliness, may be all that is required, the bowels having been regulated by the administration of a gentle laxative. In the examples admitted into our hospitals, however, such simple treatment seldom suffices, one case only out of the sixteen having been so treated. The majority of instances are of a graver nature, and require for their relief some operative interference.

The division of the superficial fibres of the sphincter situated at the base of the ulcer is the correct treatment, this operation being best performed by drawing a short scalpel over the ulcerated surface, having exposed it freely to view by means of a valvular speculum. In the milder instances before me, this treatment proved most successful; but in the severest forms of this disease, the complete division of the sphincter appears most applicable. There is no objection to this practice even in the simpler cases; but if the less severe measure is sufficient, a greater operation can hardly be deemed essential.

The bowels in all cases should be attended to, gentle laxatives being required; rest, also, after the operation, is to be recommended. These measures are, as a rule, followed by immediate relief, and convalescence is speedily obtained.

CHAPTER XXX.

ON POLYPUS OF THE RECTUM.

The fact that the rectum may be the seat of a polypus has been long recognised, but at the same time this affection has been always regarded as a rare one. The in-door experience of a hospital would certainly tend to support such an opinion, but two cases having been admitted into Guy's Hospital for the last eight years. This conclusion, however, is by no means correct, as in the out-door practice of the institution the cases are far from rare. To prove the truth of this opinion, and also to

point out the symptoms by which the presence of a polypus may be distinguished, I was induced to bring the subject before the notice of the London Medical Society ; and the short paper I then read was published in the 'Lancet' for November 26th, 1859. On that occasion, I gave the short notes of many of the cases which had most recently passed under my care, and exhibited the polypoid growths which had been removed. Since that date, I have had no reason to doubt the accuracy of the opinions I then gave ; indeed, subsequent experience has only confirmed their truth.

This disease is by far the most common in children and in those under ten years of age ; and the existence of the polypus is generally indicated by the presence of hæmorrhage from the bowel. "In some cases the discharge of blood from the bowel is constant, and the patient will be brought with its clothes stained, and its buttocks smeared with a bloody mucus ; in these instances the polypus will generally be found to be within, if not protruding from the sphincter. In other examples occasional discharges of blood will be observed, although not to any very great extent, and this discharge will generally accompany and follow the act of defecation. In others again the hæmorrhage will take place independently of any such process." There will generally be some straining after stool, and prolapse of the rectum is a rare accompaniment ; but, since the publication of my paper upon this subject, I have had one example in which this complication existed.

If the rectum is carefully examined when these symptoms are present, a polypus may be detected. Some care is required in the examination, as the growth is readily passed by and overlooked. The best plan is to sweep the finger, passed well into the rectum, completely round the walls of the bowel ; the polypus will then be dragged from its attachment, and its pedicle will be made tense, thus arresting the attention of the examiner : by a careless examination it is almost sure to be overlooked, unless very large. Having detected it, its removal is the only correct treatment ; this may, in many cases, be done at the time by simply hooking the finger over the pedicle, and breaking it off. In other cases, the polypus may be forced externally, and ligatured ; and when this cannot be done, the growth may be dragged downwards by forceps or by a wire noose.

The removal by the finger is the readiest and best practice. After the operation a cure may confidently be promised, care being taken by the surgeon that a second does not exist.

These polypi in children are of a fibro-cellular structure; but when taking place in adults, the fibrous element becomes more general; consequently, the rupture of the pedicle is not so easily secured, and indeed the application of a ligature must be regarded as the best practice.

One of the two examples of this disease which was admitted into the hospital came under my care. Both were, however, in adults, and of the fibrous form.

CASE.—It was in a man, æt. 42, who had experienced hæmorrhage from the rectum for one year, and protrusion of a nut-like body in the act of defecation. This protrusion was at first, however, readily returned on the slightest pressure; but for the last six months it had been always down. He had been under treatment for many months for hæmorrhoids. On examination, a fibrous polypus, the size of a large almond, was readily detected growing from within the sphincter; a ligature was applied to its pedicle, and it sloughed off, convalescence following.

CHAPTER XXXI.

ON STRICTURE OF THE RECTUM.

In this chapter I have included the cases of simple and malignant stricture; and I have done so on account of the difficulty, if not impossibility, of forming a definite diagnosis during life. The malignant structure is usually of the epitheliomatous form, although a genuine carcinoma may certainly exist.

I possess the notes of forty-eight examples, this number including all admitted into the hospital in nearly eight years. This fact is sufficient to show that the disease is not so common in its occurrence as some men would lead us to believe; and this

experience of the in-door is well supported by the out-door practice.

Sex.—Thirty-two of the forty-eight examples were in women, and sixteen in men, the disease apparently being twice as frequent in the female sex as it is in the male.

To show the age at which this disease generally makes its appearance, the following table has been drawn up :

	Males.	Females.	Total.
Under 20 years of age . . .	—	2	2
Between 20 and 30 years of age . . .	5	13	18
" 30 " 40 " . . .	1	5	6
" 40 " 50 " . . .	5	8	13
" 50 " 60 " . . .	3	3	6
" 60 " 70 " . . .	2	1	3
	—	—	—
	16	32	48

It is interesting to observe, that a large proportion of the cases occur between twenty and thirty ; and that the decennial period between forty and fifty is also a favorite one for the development of the stricture, only six cases being tabulated as taking place in patients between thirty and forty years of age. It does not appear improbable that this is the line between the simple and malignant forms of disease ; the cases taking place in early life being of the former nature, and those tabulated as appearing at a later period of life being malignant.

Duration of the disease.—

18 cases had existed but a few months ;

24 " between one and four years ;

7 had existed five, five, seven, seven, eight, and ten years, respectively.

Result.—Forty-five of these cases were relieved by treatment, and three died ; one sinking from exhaustion, one from hæmorrhage, and one in the thirteenth day after relief afforded by the opening of the colon in the loin.

Treatment.—When the disease has not proceeded to the ulcerative stage, much benefit is doubtless derived from the treatment by dilatation. The passage of bougies must be carried out, however, with considerable caution, or else an ulceration will be set up, and more harm than good will be the result of such a practice.

The bowels should in all cases be kept loose by simple diluents, the *Mistura Olei* of the Guy's Pharmacopœia being an admirable mixture; it does not irritate in the slightest degree, but appears to act by simply rendering the motions more liquid and consequently more easy for evacuation.

If the stricture is in a young patient, and appears to be inflammatory in its nature, the administration of a mild mercurial is to be recommended, the bichloride of mercury or the iodide being the best form. In all cases the general health of the patient must be carefully attended to, and tonics with stimulants administered, when they can be tolerated.

In the ulcerative stage the treatment by dilatation must be regarded as injurious. It causes great suffering to the patient, and can do no good, the instrument acting only as an irritant, and thus increasing the disease, instead of relieving it.

When death threatens from the result of complete obstruction to the bowels, the opening of the colon in the loin appears to be a feasible and beneficial practice. In the single case in which it has been required during the last eight years, immense relief was afforded to the patient, and life was undoubtedly prolonged. On that account alone it may therefore be recommended, and, when the practice can be carried out, should not be neglected.

CASE.—The case alluded to was a patient of the late Dr. Addison's, and it was passed into my hands for operation. It was in a woman aged forty-eight, who had had symptoms of stricture of the rectum for one year, and of complete obstruction for three weeks. The colon was opened in the left loin, without difficulty, by means of the vertical incision, and the edges secured to the integument; quarts of fæces were removed, and the relief afforded by the operation was most marked. For thirteen days she survived the operation, and sank purely from exhaustion. After death, a stricture was found in the upper portion of the rectum.

CLINICAL SURGERY.

ON

STRICTURE, RETENTION OF URINE,

STONE IN THE BLADDER,

AND OTHER

DISEASES OF THE URINARY ORGANS.

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ON
STRICTURE, RETENTION OF URINE,
STONE IN THE BLADDER,
AND OTHER
DISEASES OF THE URINARY ORGANS.

IN previous pages, the surgery of the Nervous, Respiratory, Circulatory, and Digestive Systems have received our attention, and each subject in its turn has been as freely illustrated by clinical data, as the analysis of the materials in my possession has allowed. The facts which this analysis has yielded I have freely given, knowing them to be true; and the conclusions and opinions which have been drawn from their consideration are open to the verification of all who feel disposed to examine for themselves the grounds upon which they are based. Many of the conclusions to which I have been led have materially differed from those which I had previously entertained; but the positive evidence of definite data became irresistible, and at once overpowered and corrected the opinions which had been gained in the school, and which had been too often only based on the impressions of some "men of mark," and not upon collected and registered knowledge.

For every day's experience convinces me more and more strongly, of the fallacy which is too often contained in all opinions formed only from impressions—however extensive may be the field from which they have been gleaned—and leads me

to value more highly the definite data which can only be obtained from the collection and analysis of positive material.

Pursuing the same course as I have followed on former occasions, I propose on the present to consider the surgery of the genito-urinary system, being guided in its consideration simply by the facts which the analysis of the mass of materials before me may yield.

Stricture and its complications, retention of urine and its causes, stone in the bladder and its treatment, may form the chief subjects for consideration; but others, which are not less interesting, will receive a notice, as far as space and materials will allow. In the following table the whole source from which our conclusions will be drawn, can be readily seen :

Table of the Surgical Diseases of the Bladder and Urethra admitted into Guy's Hospital between October 1st, 1853, and March 30th, 1861.

Diseases.	Cured or Relieved.	Died.	Total.
Simple organic stricture	336	9	345
" " with retention	106	3	109
" " with extravasation of			
urine	30	15	45
" " with urinary fistulæ.	46	1	47
Traumatic stricture and its complications . .	34	1	35
Cases of "external division" and "perineal			
section"	36	7	43
Cases of puncture of bladder per rectum . .	20	3	23
Retention of urine	76	4	80
Ruptured urethra	19	—	19
Urethral calculus	12	2	14
Irritable bladder	134	2	136
Incontinence of urine	22	—	22
Hæmaturia	19	—	19
Inflammation of the prostate	6	—	6
Calculus vesicæ	112	22	134
Total	1008	69	1077

CHAPTER XXXII.

ON STRICTURE OF THE URETHRA, ITS CAUSES AND COMPLICATIONS.

IN the present chapter, the subject of organic or permanent stricture will be alone considered. The so-called inflammatory and spasmodic stricture will be alluded to in the chapter on Retention of Urine. It is, however, almost needless to remark that organic or permanent stricture is in its origin inflammatory, although the inflammation is of a chronic nature; and that, as a rule, the spasmodic stricture is more or less associated with the organic. Nevertheless, the distinction between these different classes of cases is now well understood, and it will be sufficient for my present purpose to remark that the organic stricture alone is the form which will be treated of in the present chapter.

Organic or permanent stricture includes, however, two very distinct classes of cases; distinct in their origin and in their pathology; differing also much in their treatment, and more in their results.

The first may be described as *simple organic stricture*, or that form resulting from some chronic inflammatory condition of the mucous or submucous membrane forming the urethra. The second, as *traumatic stricture*, or cicatricial, or that form which follows upon a partial or complete rupture of the canal the result of external or internal violence. The term simple organic stricture will apply therefore to the former variety; and traumatic to the latter. It will be seen in the table that the simple organic stricture is the most common, as my notes give me 603 cases of the former, and 43 only of the latter.

On simple organic stricture.

Any diminution in the calibre of any part of the course of the urethra, occasioned by the contraction of some inflammatory deposit situated upon, within, or beneath the mucous membrane of the canal, is denominated a permanent or organic

stricture. In the majority of cases the action is of a chronic nature; in some it may be readily traced to a more or less distinct chronic inflammation of the passage; but years will frequently pass away before any obstruction to the flow of urine becomes of sufficient importance to arrest the attention of the patient, and this may at last, perhaps, be first drawn to the part by a sudden attack of retention of urine, which has been induced by some act of irregularity or from exposure to cold.

The valuable researches of Mr. Henry Thompson into the pathology of this disease have well demonstrated the various pathological conditions which have given rise to stricture; the museums of London and of Paris furnishing the materials from which his deductions have been drawn. The obstruction may consist simply of a perforated membranous diaphragm stretched across the canal, or of a narrow band of inflammatory product surrounding the passage, giving rise to the terms "whipcord" or "annular" stricture. The stricture may be general or only partial, and when the latter, the stricture may have been caused by some adhesion of the natural rugæ of the urethra, or of some folds of its mucous lining; rarer cases being occasionally found produced by bands of lymph forming across the passage, and known under the title of "bridle strictures." When the stricture is more extensive in its nature, there is hardly a limit to the extent of inflammatory deposit which may at times be present, from the narrow band which has been alluded to as forming the "annular" stricture, passing onwards to the broader band which answers to Sir A. Cooper's term of "ribbon" stricture, to the still severer cases in which the urethra is found more or less contracted throughout its entire course. Between these extremes, numberless varieties and degrees of mischief may be observed. The urethra presenting one single contraction, or several independent ones; positive evidence being, however, wanting, to prove that more than three separate strictures have ever existed; although there are doubtless many instances in which the whole passage is materially encroached upon and contracted from inflammatory changes.

Lastly, the urethra may unquestionably become "impermeable," the pathological specimens in Guy's Museum being enough to demonstrate the fact; such a condition cannot, how-

ever, exist uncomplicated with other symptoms, for it is obvious that the urine must have some channel for escape. As a result, therefore, in these cases, urinary fistula will always be found.

Locality of stricture.

For the only definite facts relating to this subject, I must again refer with pleasure to the labours of Mr. Thompson; for although other writers have given their "impressions" upon the subject, and have published isolated cases, it is to him that the profession is indebted for the analysis of the large number of cases contained in the various museums, by which this question could have been alone satisfactorily determined.

He has most satisfactorily proved what is now generally received as true, that in by far the majority of cases of stricture the junction of the spongy and membranous portions of the urethra is its most frequent seat; and that the next position in point of frequency is the inch situated in front of this spot; some few cases being found in the distal end of the membranous portion. The centre of the spongy portion is the next position in order of frequency, in which strictures are to be found; the external orifice and the terminal two inches of the urethra being the third: no specimen existing in which a stricture has been observed in the prostatic portion.

I have deemed it right for the sake of clearness to preface my own clinical remarks by these interesting pathological and practical facts collected by others, as it cannot be doubted that a correct knowledge of these points is most essential to ensure a practice based on correct principles.

Causes of stricture.

In this section I shall be guided alone by the clinical facts afforded by the analysis of my own materials, believing that 603 cases of simple organic stricture are amply sufficient to furnish, by themselves, conclusions of definite value. My object, when I began these papers some years since, was to add to our stock of knowledge, and not to publish a compilation of other men's works. I propose still to abide by that resolution, recognising no reason why I should change; at the same time I may add, that if I do not refer to the labours of others, it is

from no want of respect or of appreciation of the value of their investigations, but simply that by doing so I should alter the whole character of my own communications, and thus neutralise the object with which they were undertaken.

Looking over my own cases with the view of inquiring into the causes of stricture, I find that out of the 646, chronic gonorrhœal inflammation had existed in 273 instances; and that direct injury was the assigned cause in 43; leaving 330 cases in which no definite cause could be obtained. Out of the 273 cases in which a gonorrhœa had previously existed, it is also to be observed that in 78 of these injections had been employed in its cure. With these facts, the following conclusion as to the causes of stricture appears to be justifiable:—"That although gonorrhœa is unquestionably a common cause of stricture, that at least half the cases are found in subjects who have not suffered from such a disease; and that when gonorrhœa might fairly be put down as an assigned cause, the use of injections for its cure does not appear to have had any positively injurious influence in producing a stricture." I may add that the results thus brought out can be strictly relied on, as considerable care was taken when noting the cases to search out this fact; it may therefore unquestionably be asserted that injections have not the injurious influence in exciting stricture which some authors have ascribed to them.

Amongst the 330 cases in which no positive cause could be assigned, were three in which "gout" existed; and several in which the contraction of chancres might fairly be put down as the cause of the obstruction.

I have been unable to make out that the so-called phosphatic diathesis has any influence in exciting the formation of an organic stricture, or any positive urethral disease; although this is a point upon which Sir B. Brodie has much dwelt; but there can be no doubt that any morbid condition of the urine has considerable power in exciting a spasmodic contraction of the muscular walls of the urethra, and more particularly when an organic stricture exists, and thus may be the cause of a retention of urine.

As a summary of the causes of stricture, the following conclusions may fearlessly be drawn:

1. That chronic gonorrhœal inflammation may fairly be

ascribed as its cause in 42 per cent. of the cases; direct injury to the urethra in 6.6 per cent.; and that in at least half the cases no definite cause can be assigned.

2. That the use of injections in the cure of gonorrhœa does not appear to have any decided action in the production of a stricture; such injections having been employed in but 28 per cent. of the cases in which a previous gonorrhœa had been regarded as the assigned cause; and in but 13 per cent. of the whole number of cases of simple organic stricture.

3. That whatever influence an irritating hyper-acid or alkaline urine may possess in exciting a spasmodic condition of the urethra, there is no positive evidence to be obtained that it has any power in producing organic stricture.

With these conclusions as to the causes of stricture I propose to consider briefly its complications or effects. Stricture with retention of urine, extravasation of urine, and urinary fistula being the chief.

The complication and results of stricture.

In a large proportion of the cases of simple organic stricture, an attack of retention of urine is the first thing which attracts the attention of the patient to the fact of its existence. It may be that some indiscretion in diet, or what is more common some excess in drinking, or exposure to cold, are the immediate causes of the retention; and it is then, perhaps, for the first time, that the patient can bring to his recollection the truth that other less marked but not less certain symptoms had existed for some time previously; fairly showing that the stricture had been gradually developing. It may be that some chronic gleet had been present for many months; that at times some little pain, if not difficulty in micturition, had been occasionally experienced; that the stream of urine had at times, perhaps, been somewhat narrowed, or had even appeared twisted, divided, or of a screw-shape. But these symptoms had not by themselves made sufficient impression upon the mind of the sufferer, to lead him to suspect the existence of a stricture, or to seek advice.

Some frequency of micturition or even irritability of bladder might also have been present, but these symptoms do not

generally prove sufficient to draw the attention of the patient to their correct cause.

As already stated, therefore, an attack of retention of urine is, in a large proportion of the cases, the first positive symptom by which the presence of a stricture is made known, and this complication is therefore the first which claims our attention.

Stricture and retention of urine.

The frequent connection between retention of urine and simple stricture, is well shown by the analysis of my own cases. My notes yielded me the particulars of 483 cases of simple organic stricture, and in 129 of these, or in 26·7 per cent. the patient had been admitted with retention of urine; and in all of these organic stricture of various degrees of severity was subsequently detected upon the passage of a catheter, for examination and relief.

It must not be thought, however, that this retention of urine had been caused by the gradual contraction of the organic stricture; in some few of the cases, perhaps, such a condition might have existed, as a history could be obtained of the slow but certain diminution of the stream of urine for some months previously. But in the majority of instances no such account could be obtained, and it was tolerably certain that some sudden spasmodic condition of the urethra had coexisted with, and had been grafted upon, the organic stricture, and had thus given rise to the retention. In a diseased urethra, it would appear that very slight causes are capable of exciting a spasmodic condition of its muscular fibre, and thus of causing a sudden retention.

Stricture and extravasation of urine.

If there is no complication of stricture which naturally excites more alarm in the mind of the patient than a sudden attack of retention of urine; there is certainly no result which excites greater anxiety in the mind of the surgeon than the occurrence of extravasation; for this excretory fluid when present in

any abnormal position of the human frame is so deadly in its local influence, that whatever tissue becomes infiltrated with it is almost certain to be destroyed ; and should this extravasation be continued, the effects upon the powers of the patient become so severe as to endanger life. As a complication of stricture, therefore, it is one of the first importance, and requires, in its successful management, a boldness of treatment which is indispensable.

The causes of extravasation of urine, as a result of organic stricture, are not difficult of comprehension. They are gradual in their progress, and certain in their end ; and it may be unquestionably asserted that such a result will invariably follow the presence of an organic stricture, should the case be treated by neglect, or by what is worse, bad practice. An obstruction existing to the urinary flow, the bladder with the whole power of the abdominal and expulsive muscles are at once excited into action, and by increased and more concentrated force, do what they can to overcome the obstacle. It is true that in the early stage of an organic stricture this obstruction is but slight, but in its progress it becomes gradually more complete ; and the effects of this increased power to overcome the impediment are, nevertheless, certain in their end although they may be slow in their influence.

Let any obstruction occur in the urethral passage, in any part of its course, its influence must naturally be primarily experienced in that portion of the urinary passages behind its seat. The first and most immediate effect of the obstruction is the dilatation of the canal, and that section which lies in juxtaposition with the line of stricture is the one which will suffer the most materially. As this process of dilatation progresses, the walls of the urethra will at first naturally expand, but at a later period, an inflammatory action will be set up, the result of pressure, which will be followed by other changes. The effect of this is to excite a thickening of the membranous walls of the urinary passage situated behind the stricture, and in many cases this is followed by an ulceration. A more or less elongated and extensive cavity is thus produced, which is formed by the expanded, inflamed, and thickened urethra, into which the urine is first propelled by the muscular action of the bladder and the abdominal muscles. In

this way an abscess may be produced behind the stricture, which, commencing within the urethra, will soon spread to the tissues in the neighbourhood. Upon the walls of this abscess the whole expelling power of the urinary apparatus will now be expended, and in proportion to the completeness of the obstruction in the passage will the evil influence of the force be felt upon the expanded walls of the urethra or its associated abscess. Sooner or later, however, unless the stricture is relieved, the ultimate effect of this constant tension upon the dilated passage will, to a certainty, be proved, and at last by some violent, sudden, or prolonged effort, the thickened wall will break down, and the urine will become extravasated into the tissues around.

A momentary relief from the previous agony may for a time lull the apprehensions of the patient, and the sensation which so often exists, that something has given way, may mislead the sufferer into the idea that all is well. The swelling of the perineum, scrotum, penis, and abdominal walls, of one or of all, soon, however, reveals to the professional observer, the true nature of the accident; and the absence of any flow through the natural channel confirms the fact that the urethra has given way and extravasation of urine has taken place.

The destructive nature of this urinary infiltration, unless actively treated, will be also rapidly revealed by the great change which at once shows itself in the structures involved. The integuments rapidly inflame and symptoms of gangrene speedily appear; the peculiar lividity of the integument and mottling of its surface too clearly pointing out the nature of the changes which have taken place.

The constitutional symptoms accompanying these local changes are not less marked. The momentary relief given to the patient by the rupture of the urethra is rapidly succeeded by constitutional depression. The pulse sinks both in power and in size; the skin becomes cold and soon bathed in sweat; the respiration hurried, and the brain poisoned, delirium and coma, as a rule, preceding death.

My notes yield to me 55 cases of extravasation of urine; that is, of 603 examples of simple organic stricture, 9·1 per cent. were admitted with extravasation; and of those 15 died, or 28 per cent.; this mortality is sufficient to excite alarm,

and to prove, without doubt, the danger of the complication. The treatment will be discussed in a later page.

Stricture and urinary fistula.

The process by which an extravasation of urine is produced as a result of organic stricture has been already explained; and it has been shown how any *sudden* giving way of the urethra, either by rupture of its distended walls or by ulceration, will necessarily be followed by that fatal complication. I propose now to consider briefly the subject of urinary fistula, and to trace its causes, with the method of its production.

The consideration of the former complication will readily enable any reflecting student to understand the mode of development of the latter; indeed, in many cases, a urinary fistula is simply a result of an *extensive* extravasation. The more limited or local form, however, is generally the antecedent of a urinary fistula, the result of a simple and not traumatic organic structure. The method of its production is as follows: A contraction of the urethra taking place from inflammatory action, as already explained, a dilatation sooner or later necessarily follows of that portion of the passage which is situated immediately behind the stricture: inflammation of the part succeeds, with ulceration; a drop of urine becomes extravasated into the cellular tissue, and fresh inflammation follows; it is, however, of a local character, forming a local extravasation; an abscess is thus formed which may exist for weeks, or even months, appearing only as an indurated mass to be detected in the perineum, or in the neighbourhood of the stricture. Like other abscesses it has a constant tendency to approach the surface, and after a time varying in every subject, the abscess bursts externally, discharges its semi-purulent and urinous contents, and thus proves the commencement of an urinary fistula.

The contents of these abscesses are generally extremely offensive, they are caused by a local urinary extravasation, and, as a rule, the contents are composed of this decomposing secretion mixed with pus. There may be many of these openings or only one, but the method of production of all is the same. They are found in the perineum, in the scrotum, around the

anus, or even within the thigh, or above the pubes, there being no limit to their situation or to their numbers : wherever urine can infiltrate and excite suppuration, there an abscess must form, and probably a urinary fistula.

I have the notes of 65 cases of stricture so complicated, 3 of which died, two of them after perineal section.

CHAPTER XXXIII.

ON THE TREATMENT OF STRICTURE.

IF any argument were needed to prove that the present treatment of stricture is not generally satisfactory to the professional mind, it would be only necessary to point to the various plans of treatment which are brought forward from time to time—as improved if not certain means of cure—to confirm the accuracy of the observation.

The principles, however, upon which the majority of these methods are established, are in all the same ; the ingenuity of their advocates having been fortunately expended in suggesting a variety of means by which these principles can be carried out.

The pathology of stricture has been already briefly alluded to, and it can be only upon a correct appreciation of its nature that any scientific or available treatment of this affection can be established. It has been shown in a former page how a stricture is generally produced, and how it essentially depends upon the secondary contraction of a band of fibrous material poured out into the tissues of the canal by some previous inflammatory action, or in the repair of some partial or complete laceration of the urethra. The object of all treatment, therefore, should be directed to neutralise the tendency which this inflammatory product, or cicatricial tissue has to contract ; and the object of the surgeon should be directed to remove, if possible, the sources of the disease, to restore the natural calibre of the urethra, and having succeeded in the attainment of these ends to maintain the subsequent patency of the canal, and to neu-

tralise that tendency to recontract which must be described as an inherent and natural property of all inflammatory products, as well as of the cicatricial.

To accomplish this end, one and all of the varied plans of treatment are differently calculated ; and with the view of adding to our stock of knowledge upon the subject, I shall now proceed to show in what measure the experience of Guy's Hospital may avail to assist in the solution of the difficulty. But before doing so, perhaps it would be as well to dispose of an observation which has been just made, and upon which some mistaken ideas may be based, and that is, as to the cure of stricture.

Can a stricture be ever completely cured? That is, can the urethra, which has, either from some inflammatory action or from an injury, become so contracted as to cause stricture, be ever permanently restored to its normal healthy condition?

I should hardly like to answer such a question positively in the negative, for it is perfectly conceivable that such a result might be obtained, and cases do unquestionably occur of *simple* organic stricture, in which treatment has restored the normal patency of the canal, and in which no subsequent return has ever been observed. Still, for practical purposes, it is as well to believe that strictures are not absolutely curable ; but that, after the canal has been restored to its natural calibre, occasional surgical treatment will be required to maintain the patency of the passage which the primary treatment may have secured.

I believe this opinion to be one which most surgeons will endorse, and have deemed it better to state the case at the beginning of the consideration of the treatment, to prevent any misconception as to the nature of the cures which may be dwelt upon in subsequent pages.

Analysis of cases.—Briefly analysing the 603 cases of simple organic stricture I have before me, with its several complications, and disregarding for the present the immediate treatment which an attack of retention of urine may have required,

565 cases were treated by simple dilatation of the urethra ; and

38 by some operation opening the urethra in the perineum.

Analysis of the 43 cases of traumatic stricture.

37 were treated by dilatation ; and

6 by opening the urethra in the perineum.

It will be thus seen that in both simple and traumatic organic stricture, the treatment by dilatation is the one which is most generally employed; the treatment by means of the knife being resorted to only in exceptional and obstinate cases.

Treatment by dilatation.

The simplicity of the treatment of a case of stricture by dilatation—that is, by the passage of some bougie, sound, or catheter—commends itself at once to the mind of a surgeon. In the hands of a man but moderately skilful, the introduction of an instrument through a slight stricture is not an operation of difficulty, and the uniform success which attends the practice is sufficient to make this plan of treatment tolerably general. It may, therefore, without doubt, be positively written that cases of simple stricture, which can be readily dilated by means of instruments, should be so treated, and that such mechanical means are amply sufficient for their cure.

In a slight case of stricture, that is, one in which the stream of urine is but partially narrowed, forked, or twisted—in which a No. 3 or 4 instrument can be passed without much difficulty, and in which there are no other local symptoms than that of obstruction, and no constitutional symptoms, the daily introduction of an instrument just large enough to pass through the contracted canal, will, in the majority of cases, be quite sufficient to ensure a cure. It will not be necessary to confine such a patient to his house, or to forbid exercise, although, where these extra advantages can be secured, the cure will be more rapid. If the secretions are out of order, alteratives must be given, and if the urine is at all high coloured and irritating, some saline or alkaline, will be found of benefit. The tartrate and nitrate of potash are unquestionably the best, fifteen or twenty grains of the former, and five of the latter in some bitter infusion acting most beneficially.

In cases of greater severity, however, this treatment will seldom be of equal service. The same principles of treatment, doubtless, must be carried out, but the details will require to be modified according to the exigencies of the symptoms.

If the canal is so contracted as to admit of but the smallest

instrument, it is tolerably certain that the bladder will be found to be more or less irritable, and the urine altered in its character; these symptoms having been produced by the unceasing efforts of the bladder to overcome the obstruction caused by the gradually contracting urethra.

Rest in the horizontal position in these severe examples is almost a necessity, to enable the surgeon to carry out his treatment of dilatation with success; and although in occasional cases a fortunate result may be accidentally secured, without such rest, the progress of the case will be but slow, and the treatment unsatisfactory. When rest can therefore be maintained, it should be enforced, and if the patient is either unable or unwilling to carry out this advice, the surgeon should, for his own sake and to prevent disappointment, warn him of the uncertainty with which the treatment of his case will be undertaken and the dangers to which he will be exposed; for by labour and exercise he will not only retard his recovery, but he will be exposed to the risk of any one of the many complications to which a man with stricture is always liable.

Assuming, therefore, that the subject of a narrow organic stricture will agree to maintain rest, that is, the horizontal posture, for it is hardly necessary to keep in bed, what is the treatment to be pursued? If the bowels are costive and secretions out of order, let them be corrected before any local treatment be commenced; a day or two's rest before the attempt to pass an instrument is made is often most useful, and success will often follow such a practice when failure had resulted from an earlier effort. If the bladder is irritable, and urine irritating or high coloured, administer an alkali, the combination I have already quoted being the best, and the surgeon may then proceed with some confidence to the special object of his treatment.

It will be taken for granted in the case which is being sketched, that the surgeon has already made himself acquainted with the nature and size of the stricture with which he is about to deal.

In examining a case for the first time, the surgeon should select a large metal instrument, No. 6 or 7 being a very useful size; if this fails to pass the stricture he may select one a size smaller, and so on, till he finds one that will enter if not pass through the stricture.

The instrument should be well warmed, being made the temperature of the body, so that it will not therefore cause spasm or contraction of the urethra; it should be well lubricated with oil, and passed very slowly, so as not to frighten the patient.

The surgeon should, when passing the instrument, talk to his patient, in order that his attention should be withdrawn from the operation, and any obstruction from causes of that description thereby removed.

Having thus learned the character of the stricture with which he is about to deal, an instrument should be selected which there is some fair prospect of the surgeon successfully guiding through the stricture—a metal one is, perhaps, the best, as it can be used with greater confidence, and at an early stage of the treatment it enables the operator to obtain a more general knowledge of the condition of the passage and the nature of the stricture.

If the instrument can be manipulated without force through the constriction, a great point will have been obtained, and the patient may be then assured, with considerable confidence, that a successful result may be looked for within a short date.

Force is a relative term in its nature, and it is difficult to define its exact meaning; but few surgeons who have passed an instrument through the urethra can fail to appreciate its correct interpretation. Practically it means that the end of the instrument is not to be pushed through the tissues, and that, therefore, a false passage is not to be made, or a laceration of the urethra to be risked.

Quiet manipulation and steady pressure will succeed in guiding any instrument through a stricture if it is directed in the right channel; and when this fails, force will not succeed. Force is synonymous with laceration, and is therefore to be condemned; it is never necessary, and it is therefore to be avoided.

Having, then, succeeded by manipulative efforts to guide a metallic instrument through a stricture, what is to be done? is the instrument to be removed, or is it to be left in? and if so, for how long?

If the instrument is a catheter, which is to be preferred, which the surgeon has evidently only just succeeded in

passing through the stricture, as evidenced by the firm and peculiar grasp with which it will be held, the safest practice to be followed is to leave it in. The probabilities of failure in a second attempt at its introduction after its removal, or of passing an elastic catheter, are very great; and as success has followed this first attempt, it is as well that the operator should be satisfied; let him, therefore, leave well alone, and fasten the catheter in the bladder for a time, fixing it to the penis.

If the presence of the instrument can be borne for one, two, or three days, so much the better; the local indications for its removal being its looseness; this condition indicating the fact that the stricture has been evidently dilated, if not partially absorbed, and it is proved by the absence of grasp which was so evident on its first introduction. If this effect is produced after the presence of the instrument for only a few hours, and no irritability of bladder exists, it is as well to leave the catheter alone, and not to remove it for at least a day; it may then be taken out, and an elastic catheter of a size larger, guided by means of a firm stillette, introduced in its place; by the repetition of these means a simple organic stricture may be readily cured without pain and without danger.

If an elastic catheter can be passed from the first, an advantage is obtained; as the bladder is far more tolerant of the presence of such an instrument than of a metal one; and it is also far more comfortable to the patient.

If there is much irritability of bladder induced by the presence of the catheter, a few hours' interval may be allowed between its removal and the reintroduction of a larger one. Alkalies, however, an opiate and rest will, as a rule, rapidly allay the violence of these symptoms, and permit the local treatment to be pursued.

If the bladder should be naturally irritable and unable to tolerate the presence of an instrument, a compromise in the treatment must then be made; the catheter may then be passed through the stricture, and left there until the patient requires to micturate; it must be then withdrawn, and reintroduced at the surgeon's next visit, and left in as before; perhaps a larger instrument being selected; this plan of treatment is good, but is more tedious than the one previously described, which is unquestionably the best and most satisfactory treatment.

Some surgeons are in the habit of using catheters perforated at their extremity ; such an instrument it would be as well to pass through the stricture, and that is all, leaving the catheter *in situ*, and through this patent extremity the patient will probably, when called upon, be well able to relieve his bladder.

The plan of treatment by gradual dilatation which I have just sketched, is the one which is generally employed at Guy's Hospital, with such slight modifications as the peculiarities of each case, and their several complications, suggested to the surgeon ; it has been practised with success in the 565 cases of simple, and the 37 cases of traumatic organic stricture, which have been tabulated.

It is a method of treatment which is both satisfactory and successful. It is attended with little or no danger, and is one which, with moderate skill, can be efficiently carried out ; and as its results are all that can be desired, it is one which is cordially advised.

It is not to be doubted that cases do occur in which this treatment will be found to fail ; other plans must then be had recourse to ; but the simple plan should be the method first employed in the majority of cases, and when it fails it is time enough to be prepared to carry out other views.

The treatment of simple or traumatic organic stricture by gradual dilatation, should be the rule of practice, and other plans the exception ; the success which has followed the practice at Guy's Hospital warrants this conclusion, and enables me with confidence to express it in these pages. In saying this, it is by no means intended to convey the impression that other plans carried out by able surgeons who are in the habit of their daily practice, are to be looked upon as valueless, and should be rejected ; for doubtless they are of use in many cases ; but my object has been to show what practice has been proved to be of value in large numbers of cases of disease in a large hospital, and with such evidence it would be impossible to reject the practice which has been laid down and to pass to others which are comparatively untried, and which are more complicated.

As surgery improves, the tendency of the last few years has been to show that its true improvement has always been

towards simplicity ; complexity of treatment is generally bad, as being meddlesome and unnecessary.

Forcible dilatation, as practised by Mr. Holt ; the destruction of the stricture by means of caustics, and other plans, commend themselves to our consideration by the eminence of the men who are their advocates ; and by the success which has been said to follow their respective practices ; and doubtless they are of great use ; and as time passes and experience accumulates, the *class of cases* in which they may be employed will be more accurately defined. But as long as the simple treatment which has been described continues successful, that is, as long as the stricture can be readily dilated without pain and without danger, and, at the same time, with almost uniform success, it would require more faith than I now possess in the value of the so-called recent improvements, to enable me to believe that they will supersede the treatment which has been described, and which has been clearly proved, beyond a doubt, to be of value. Having no personal experience in the value of these plans of treatment, I speak of them with caution, yet with respect, and shall be only too ready to carry them into practice when accumulated evidence can be brought forward to prove that they are to be preferred to the older, simpler, and the present satisfactory, approved plan.

Forcible dilatation, as carried out by Mr. Holt, appears certainly to be a simple, and, I can well believe, a rapid and efficient means of cure. The principle of its action is sound and scientific, and if the results of more extensive experience bear out the conclusions which its author has been led to entertain, it will doubtless become a valuable and more general method. But we are not yet told whether it is to be employed in all cases, or in what class of cases it is recommended.

Internal division of the Stricture.

The treatment of stricture by internal division has received but little support from Guy's Hospital, the evidence given in the last few pages proving that the treatment by dilatation is the favorite method.

In certain cases, however, it has its advocates, and in five examples of stricture, the notes of which lie before me, it has been successfully employed. In all these cases, however, the stricture existed either at the urethral orifice or within the terminal inch or so of the passage.

The notes of the cases are as follows: the first four occurred in the practice of Mr. Birkett, the last was under my own care:—

CASE 1.—Francis F—, æt. 29, admitted with stricture of the urethra behind the glans penis of two years' duration, following a gonorrhœa. It was divided by means of a bistoury upon a director, and subsequently dilated. The man left cured.

CASE 2.—Frank W—, æt. 29, was admitted with a stricture at the orifice of the meatus following a chancre. It was very small, and caused considerable inconvenience; after its division with a bistoury it was dilated, and convalescence followed.

CASE 3.—William B—, æt. 28, was admitted with a very narrow stricture situated behind the glans, of five years' duration, following a gonorrhœa two years previously. It was divided internally by means of a bistoury, and cured after dilatation.

CASE 4.—J. B—, æt. 33, was admitted with a contracted urethral orifice, following an injury eighteen years previously. It was divided by means of a bistoury, and convalescence followed.

CASE 5.—G. H—, æt. 23, was admitted with a very contracted stricture of the urethra behind the glans, of six months' duration, following a gonorrhœa, and with retention of urine, the passage being completely closed. I divided the stricture with a urethrotome, having forced the passage, and drew off his urine, leaving the instrument, No. 11, in the bladder. On the sixth day the catheter was removed, and the man left

with instructions to pass a large bougie constantly down the passage.

These cases are amply sufficient to prove that it is only in a small class of cases that internal division of the stricture has received support at Guy's Hospital, and I am disposed to believe that this practice is about the best. The treatment by dilatation of a stricture more deeply seated is satisfactory and free from danger; and although the treatment of these cases by internal incision may be carried out with success, and without danger, it does not appear to possess any great advantages over the simpler treatment as to warrant its substitution.

The Treatment of Stricture by means of Caustics.

This plan of treatment of stricture has met with less support even than the last, and I have no case to relate in which any material benefit was derived from its practice. In several cases of very irritable strictures it has been employed with some success, but the cases appear to be tedious and unsatisfactory. In some examples of very irritable strictures the single application of the Potassa fusa appears to destroy its sensibility and allows the introduction of a catheter and the treatment by dilatation to be pursued; but the cases in which it appears really necessary or even applicable are not numerous, and the advantages which are stated to follow its use do not seem to justify its general adoption in preference to other and simpler treatment.

CHAPTER XXXIV.

ON THE TREATMENT OF PERMEABLE STRICTURE BY "EXTERNAL DIVISION."

IN the preceding chapter I have explained at some length the method of treatment which appears to be most applicable in the majority of cases of simple organic stricture; and I have

supported the recommendation of the practice by the quotation of the fact, that in upwards of 600 cases of organic stricture admitted into Guy's Hospital the treatment by dilatation has been employed with very uniform success, but thirty-eight cases out of the whole number requiring other operative treatment. At the same time it was observed that cases unquestionably occur in practice in which such simple treatment will not suffice; that if attempted it will fail; and that there are also other cases in which it is evidently inapplicable.

In the present section I propose to consider what line of treatment should be pursued in the two classes of cases in which the former method by dilatation is inapplicable; and to support the practice to be advocated by such clinical experience as I possess. In doing so I can hardly help referring to a paper which I wrote some few years ago, when the subjects of perineal section and external division of a stricture were being prominently brought before the notice of the profession. The angry feelings which then existed between rival schools have now happily subsided; and the class of cases in which operative measures are really needful are tolerably well universally recognised.

The conclusions I then arrived at, after a perfectly impartial survey of the subject, have been fully confirmed by subsequent inquiries, and I have no reason to regret the publication of opinions which, I believe, the majority of surgeons of the present day entirely support. At that time I asserted as a conclusion, what I then believed was very generally entertained:

“That in cases of organic stricture, where the passage of a catheter is possible, and not difficult, where it does not produce either any injurious or painful constitutional or local disturbance, and where, after dilatation of the stricture, an occasional passage only of the instrument is required to maintain an open channel, no other surgical means can be called for.”

But, unfortunately, such surgical treatment is not sufficient for the cure of all cases of permeable stricture, and a second statement was appended, which, it is now believed, is as generally entertained as the preceding.

“That cases of stricture do occur occasionally, which are so exquisitely sensitive that the passage of a catheter, however skilfully performed, is followed by such severe constitutional and

local disturbance, as to produce more harm than good, and in which it is clear that some other method of cure must be employed; and others, which are relieved by means of the catheter, and are even fully dilated, but which have a tendency to contract again immediately upon the omission of the treatment."

In the former class of cases, described as "irritable stricture," the treatment by dilatation aggravates instead of relieving the symptoms; in the latter class, described as "contractile stricture," it must be continued for life, to preserve an open passage.

Under such circumstances it is tolerably evident that some other plan of treatment must be adopted, and the operation of "external division" appears the best.

To Professor Syme the profession is unquestionably much indebted for having so ably recalled its attention to this plan of treatment; the external division of the stricture from the perineum being, without doubt, the most effectual means of cure for the two troublesome and painful classes of cases to which we have alluded.

The operation is by no means one of difficulty. A grooved staff, as large as can be passed through the stricture, is first introduced, the patient having been placed upon his back, as if about to be cut for stone. The surgeon should then, with perfect precision, introduce his knife into the centre of the perineum, and at one stroke cut down upon the groove situated at the lower border of the staff; using this as his guide, the perineal portion of the urethra in which the stricture is situated can then be readily and freely divided. There are but two important points to be observed in this the second step of the operation; the first is to be sure that the knife touches the groove of the staff, and secondly, that the whole of the diseased or strictured portion of the urethra is freely divided. Having succeeded in this, the essential part of the operation, the sound may be removed, having previously introduced a grooved probe or director into the bladder through the perineal wound. Upon this an elastic catheter of a large size can be readily introduced through the penis into the bladder, and fixed in.

The patient should then be sent to bed, and a mild opiate

given, such as ten grains of Dover's powder, if much general or local vesical irritability should be present.

The catheter may be left in for several days, if it should fail to cause pain. If the bladder, however, resents its presence it may be removed, and an occasional introduction of an instrument employed as a substitute. It is, however, a point of some importance that an instrument be left in the bladder for the first twenty-four hours.

With this treatment most cases do well. The stricture, or rather the old inflammatory product which, by its contraction, has caused the stricture, readily softens down, leaving the membrane comparatively sound. Repair of the divided urethra rapidly takes place, and recovery ensues.

This plan of treatment is one which is certainly to be commended. The operation is comparatively a simple one, and can be readily performed, requiring only a steady hand and a correct appreciation of the objects to be attained.

It must be remembered, however, that it is only to be carried out when simpler means have failed. In either the very irritable stricture which resents the treatment by dilatation, or the very contractile stricture, which refuses to be materially dilated by the introduction of the catheter; in these two classes of cases of uncomplicated permeable organic stricture is it to be alone employed, and in them it is most successful.

I have the notes before me of seven such examples, in all of which recovery was secured.

CHAPTER XXXV.

ON THE TREATMENT OF IMPERMEABLE STRICTURES AND "PERINEAL SECTION."

IN the pages which have been just written, my observations have been entirely confined to the treatment of simple organic stricture through which a passage exists—or rather, through which a catheter can be passed into the bladder; and I have

shown that, in such examples, the simple treatment by dilatation is the rule, and that the division of the stricture with a knife from the perineum, using a grooved staff as a guide, is to be employed in only exceptional conditions.

I supported the force of these observations by showing that at Guy's Hospital, out of 483 cases of uncomplicated simple organic stricture, a cure was effected in 476 by the simpler means, and that operative measures were only required in seven instances.

I propose in the present chapter to consider the treatment of *impermeable stricture*, and the operation of "perineal section."

Impermeable Stricture.

The examination of pathological specimens unquestionably demonstrates the fact that the urethra may become so contracted as not only to be quite impermeable to the passage of an instrument, but that in rare cases it may cease to exist as a canal at all, and may then be described as being obliterated; doubtless this condition is more frequently produced as a result of injury than as a consequence of a local inflammation, but that it is to be found as an effect of both causes, daily experience clearly proves.

Other instances of stricture also occur in practice which, to the surgeon who treats the case, are of a like character: all attempts to pass a catheter into the bladder completely fail, and, as a consequence, they are practically to be regarded as being impermeable. This impermeability may be the result of many conditions; great irritability of the passage may be a cause, combined or not with a narrow organic stricture; or it may result from a genuine contraction or obliteration of the urethra. The result, however, is the same; for all purposes of treatment the passage is impassable, and the question to be decided is, what treatment should be pursued.

If the case is uncomplicated, and has not come before our notice associated with retention of urine, extravasation, or perineal fistula, one or the other of which complications must be present if the urethra is really closed, and, therefore, impermeable, there is some reason to believe that by careful treat-

ment an opening may be found, and the case may then be subsequently treated as one of permeable stricture.

Rest in the horizontal position, warm baths, and opium, are of great value in the treatment of these cases; and mercurial alterations, with the application of leeches to the perineum, are equally useful when any tenderness or inflammatory action can be detected in the course of the urethra. By such treatment the impermeability as a symptom will often disappear, and the treatment of the stricture by dilatation be rendered practicable.

In other examples, however, no such result can be obtained. The stricture is evidently too narrow to allow of the passage of a sound, and some other plan of treatment must be adopted. In those cases the operation of "perineal section" appears to be the best, and, as a consequence, it should be performed. It should not be had recourse to, however, until all other local and constitutional treatment have been tried and found to fail, and under those circumstances the cases requiring it will be very few. Nevertheless, they do occur, and I will quote an example from my former paper in the 'Guy's Reports,' in which the practice was proved of benefit.

Robert M—, æt. 50, who had suffered from stricture for six years, was admitted under the care of Mr. Cock, with a urethra which would not admit the passage of the smallest instrument, and the attempt produced severe local and constitutional disturbance. Chloroform was given, but the urethra was still impermeable, consequently the "perineal section" was performed, and a catheter introduced. This was left in for two days; the man progressed favorably, and left, after four months' residence in the hospital, cured.

This operation of opening the urethra in the perineum without the assistance of a grooved staff or director, is by no means readily performed; it requires much consideration and great care. The readiest plan is one which, I believe, was originally planned and executed by Mr. Cock, and appears both from principle and practice to be the best; it is as follows:—Having placed the patient in the position for lithotomy, pass the finger of the left hand into the rectum, and apply its point to the anterior margin of the prostate and membranous portion of the urethra—a part which it is not difficult to detect

even in the most diseased urethras. A straight knife, with the edge turned upwards, should then be passed through the centre of the perineum, directly backwards to the apex of the urethral triangle or anterior margin of the prostate: this point being readily detected by the finger already resting in the rectum; an incision of the whole thickness of the parts should then be made upwards, the canal being freely opened and the stricture divided. By this means the urethra cannot fail to be freely opened, and it only requires care on the part of the surgeon to divide the whole stricture throughout its full extent. With a grooved probe the vesical orifice of the urethra may then be found, and a catheter, having been passed down the penis through the divided stricture, should then be introduced into the bladder, and left in.

This operation is far superior to any other which has been suggested for the division of a stricture, or for opening the urethra when a grooved staff cannot be introduced. It has been described as the operation of "perineal section," the term "external division," or Symes' operation, being confined only to the simpler cases in which a grooved staff can be passed.

CHAPTER XXXVI.

ON THE TREATMENT OF EXTRAVASATION OF URINE.

HAVING thus, then, briefly considered the treatment of a case of uncomplicated impermeable organic stricture, and described the operation which should be selected and treatment which should be pursued; I will pass on to consider the treatment of the complications to which a patient labouring under stricture is exposed, and will commence with the subject of *extravasation of urine*.

Extravasation of Urine.

Including under this heading all cases of urinary abscess which are evidently the result of a local extravasation of urine;

as well as the severer instances in which the infiltration involves the perineum with the scrotum, penis, and even abdominal walls, I possess fifty-five examples associated with simple organic stricture, and three as a result of traumatic stricture.

The pathological process by which an extravasation of urine is produced as a result of stricture has been already dwelt upon in a former chapter; it is a complication which will almost necessarily follow a neglected stricture, being one of the means which nature adopts to find an outlet for the urine, when the natural passage has become so contracted as to forbid its flow; it is a complication of great danger to the patient, and requires in its treatment great decision of the surgeon; the contact of urine with any tissue of the body except those naturally supplied, being followed by its almost certain death. The early detection, therefore, of the beginning of an extravasation is an important point, and demands from us a few practical remarks.

If a patient, the subject of a stricture, appears before a surgeon suffering from febrile symptoms more or less severe, a parched skin, a dry tongue, and a rapid irritable pulse, with or without an occasional rigor; whether there exist any local symptoms or not sufficient to have attracted the notice of the patient, the mind of the surgeon should always be directed to this point, and a careful examination made of the perineum and the parts around. The stream of urine will probably be somewhat small, but this the patient will confess to have been the case for a long time. But on examining the perineum the surgeon will probably discover in the region of the bulb a circumscribed and almost solid mass; on firm pressure some pain may be produced, but the patient will frequently add that this swelling has existed for some weeks, and that it cannot be that which is the cause of all his symptoms.

The surgeon, however, must not be misled. This circumscribed mass is in all reason a urinary abscess, the result of a local and limited extravasation, and the symptoms will only disappear when its contents have been evacuated.

What treatment, then, should be pursued? If the urethra be examined, the stricture will almost to a certainty be found much contracted, and the stream of urine will also be very

fine. Some discharge from the urethra may perhaps be observed, a little of the pus contained within the abscess behind the stricture, at times, making its way by the natural passage; but it is certain that an instrument will be passed with considerable difficulty into the bladder. If it is made to pass the stricture it will only enter the dilated, ulcerated, and suppurating cavity of the abscess situated behind, but it will be a matter of difficulty to find the urethral orifice situated in the vesical border of the abscess, and as a consequence it will be exceptional to force the instrument onwards into the bladder.

What, then, is to be done? The abscess must be opened and its contents evacuated; for if not, it will to a certainty increase, and being bound down by the perineal fascia it will pass backwards, and thus spread mischief around the neck of the bladder, and in the cellular tissue of the pelvis, to the serious injury of the sufferer.

The treatment of the stricture is a point also to be remembered, as it was this which was the primary cause of the suppuration, and no treatment can be regarded as scientific if it be not directed to remedy the stricture as well as the local urinary abscess which was its result.

Some surgeons, I am well aware, are satisfied to open the abscess in the perineum, and to leave the stricture alone to be subsequently treated by dilatation or by other means; but it appears to be the soundest and most correct practice to open the abscess, and at the same time to divide the stricture. This is readily done by passing a grooved staff through the urethra into the abscess, and freely dividing all the tissues by a scalpel introduced through the perineum; if the orifice to the vesical end of the urethra can be detected with a probe, a large catheter should be passed and left in, but this point is not of essential importance, as by the operation the surgeon is certain that the stricture has been divided; all pus is freely evacuated; the possibility of further extravasation taking place is prevented; and a free outlet for the urine has at the same time been obtained.

By adopting this practice much time is saved, the stricture being treated and probably cured by the same means that are absolutely essential for the treatment of the complication. The following case will illustrate the practice.

CASE.—*Stricture. Extravasation of urine into the Perineum. Syme's operation. Recovery.*

Charles W—, æt. 34, was admitted under my care into Guy's Hospital with a perineal abscess, which had been forming for some weeks, and a very contracted stricture which had existed for five years; all previous attempts at the introduction of an instrument into the bladder had failed. The smallest grooved staff was with difficulty forced through the stricture into the suppurating cavity which existed behind, and a free incision was made in the perineum down to the staff, dividing the stricture and laying open in one incision the urethra and abscess, giving free exit to its foetid urinary contents. By means of a grooved probe the bladder was entered through the wound; a large catheter was forced down the penis, guided by the probe into the bladder, and then fastened in; all constitutional symptoms at once disappeared, the wound healed, and the man left cured within the month.

Remarks.—This case is given as a simple illustration of the practice which has been advocated, others might be quoted to illustrate the same fact, but it is not necessary. The practical point, however, which I would impress upon my readers in the treatment of perineal abscess, accompanied with, and resulting from a contracted stricture, remaining to be repeated. —That in all cases divide the stricture when opening the abscess, using the grooved staff as your guide; and not be so unscientific as to treat the abscess the result of an obstruction to the urethra, and forget to remove the cause.

The complication of extravasation of urine does not, however, always appear in the form we have been just describing; the urinary abscess, the result of a local and confined extravasation, is the simplest form in which this urinary extravasation comes before our notice, and the treatment by which it is to be met is as definite as the local symptoms are marked, when the attention of the surgeon has been directed to the part. But the cases of extravasation to which I must now draw attention are of a severer nature, are more sudden and marked in their symptoms, and are more fatal in their effects; requiring also at the hands of the surgeon an active and energetic practice.

They are the result of a sudden rupture of the urethra, or of the walls of an abscess communicating with it; the rupture taking place suddenly during some effort of the patient, the subject of a narrow and contracted stricture, to relieve his distended and overcharged bladder.

The symptoms by which the complication is manifested are very marked. The patient will probably tell you that during some sudden expulsive effort to pass his urine, he felt something give way, this sensation being probably attended with some immediate relief to the symptoms of retention of urine, from which he had been previously tortured; other symptoms, however, will rapidly make their appearance. The patient will soon discover that the relief which he experienced was not the result of a flow of urine from the natural passage; and he will soon find, from the rapid enlargement of the perineum, scrotum, and penis, that something wrong has taken place. A burning pain will probably be experienced in the parts thus gradually enlarging, increased at each expulsive effort made to relieve the distended bladder, the absence of which, on the first onset of the extravasation, having deluded the patient into a false idea of relief and safety.

The surgeon, if now called to see this patient, will probably find him labouring under retention of urine; the perineum, penis, and scrotum, will be more or less swollen and œdematous from urinary infiltration; the extravasation, perhaps, having made or making its way upwards over the abdominal parietes, even to the thorax; if the symptoms have existed long, a peculiar inflammation and gangrene of the integuments will have made its appearance, and all the constitutional symptoms described as typhoid will certainly be present.

What, under these circumstances, is to be done?

If a catheter can be manipulated into the bladder, and the urine drawn off, a great point will have been gained, taking care to leave and fasten the instrument in.

If catheterism be impossible, as will too often be the case, some other steps must be taken to relieve the retention as well as to treat the complication of extravasation; and it becomes a question in the surgeon's mind as to which operation he shall select; should he puncture the bladder per rectum, and thus relieve the more immediate symptoms, and then proceed

to treat the extravasation ; or should he, by one operation, treat both ? The latter plan appears to me to be by far the most scientific and correct practice, and is not one of greater difficulty.

The extravasation of urine has only to be treated in one way, that is by free incisions ; in another page it has been explained how destructive the urine is to all tissues with which it comes in contact, and when extravasated there is a certain death to all the parts into which it is infiltrated unless a free escape is given to it by liberal incisions. The surgeon, then, in his treatment, has three objects to keep in mind : the first is to secure a free and ready outlet for the urine from the bladder, and thus to relieve the retention and prevent an extension of mischief ; the second is to relieve the tissues, already infiltrated, of their extravasated urine, and thus to prevent their total destruction ; and the third, which is no less important, is to cure the stricture, and thus to remove the cause upon which the complication originally depended.

The second object is readily secured by free incisions made through the integument into the infiltrated cellular tissue. The first may perhaps, as already stated, be fortunately secured by the passage of a catheter, and if this fails the end might be obtained by puncturing the bladder through the rectum ; but this latter practice does not appear to be correct, as it evidently is only a partial remedy—it relieves immediate symptoms, but nothing more ; leaving the stricture, the “*fons et origo mali*,” unnoticed and untreated. Any treatment, therefore, which will relieve the retention, give free vent to the infiltrated urine and treat the stricture, that is, which can of itself fulfil the three required conditions to which attention has been drawn, must be at once admitted to be the soundest and most correct. Either the external division of the stricture, or the perineal section, is evidently then the right operation to be employed. By either the obstruction to the flow of urine is removed and the stricture divided ; an outlet is also obtained for the urine which has been infiltrated, and a free vent is given for subsequent micturition ; at the same time the other parts into which the extravasation has taken place must be freely incised. But the perineal incision is unquestionably the most important and essential step. Make free incisions, there-

fore, into the parts infiltrated with urine, and make the perineal incision extensive and deep enough to lay bare and to open freely the urethra; doing this, if possible, upon the grooved staff, forced through the stricture, and if this end cannot be attained, by the operation which has been already described in another page; but a small grooved staff may be employed in by far the majority of cases, the employment of some force being perfectly justifiable to make it pass through the strictured portion. The following cases will illustrate the point.

CASE.—*Retention of urine and stricture; extravasation; perineal section; recovery.*—Thomas H—, æt. 27, was admitted under my care on September 9th, 1860, with retention of urine and extravasation of five days' duration. The whole of the perineum, scrotum, penis, and lower part of the abdomen were much infiltrated, and of a dark and livid colour from inflammation.

He had had a stricture for many years, and although there was no history of an injury, he maintained that he had always, as long as he could remember, experienced difficulty in micturition.

The constitutional symptoms were very severe. Free incisions were made into the infiltrated parts, and the operation of "perineal section" was performed, the stricture having been at the same time forced by a grooved staff and freely divided; a grooved probe was then passed from the wound into the bladder, and a large catheter introduced through the penis and then guided upon it into that organ; this was left in. Stimulants and sedatives were freely given, and fomentations applied to the inflamed parts. Considerable sloughing of the cellular tissue subsequently took place, into which the urine had been infiltrated; but the wound granulated kindly, and the man left after two months' stay with a urethra through which a large catheter was readily introduced, and in other respects quite sound.

CASE.—*Stricture; extravasation of urine; perineal section and recovery.*—W. B—, æt. 57, was admitted under my care with extravasation of urine into the perineum, scrotum, and penis, with a stricture which he had recognised for twenty years.

The operation of perincal section was at once performed, and a catheter introduced in the same manner as described in the last case. Other incisions were also made into the scrotum and penis. In four weeks all the wounds had healed, and he was able to pass his urine in a free stream; in another he left the hospital quite well.

CASE.—*Stricture; extravasation of urine, and large urinary abscess at neck of bladder; Syme's operation; recovery.*—T. Ellis, æt. 54, a labourer, was admitted under my care with extravasation of urine into the penis and scrotum, which had taken place after violent straining some twelve hours before admission. For several weeks previously he had also experienced pain and hardness in the perineum, with occasional rigors.

On examining the urethra, I found that it was possible to pass one of Syme's smallest staffs through the stricture, although I was unable to pass it into the bladder. The operation of "external division" of the stricture was consequently performed, giving free vent to a quantity of foetid pus which had evidently been pent up for some time in the urinary abscess. A catheter was subsequently passed, and left in. Rapid convalescence followed the operation, and the man left cured in six weeks.

Remarks.—These three cases are amply sufficient to indicate the value of the treatment which has been advised. It has the recommendation of being very simple, and is certainly most successful, and upon principle and practice appears to be the soundest. It is one which I invariably follow, and have never seen any reason to regret its adoption. I most cordially recommend it to the consideration and practice of all surgeons.

CHAPTER XXXVII.

ON THE TREATMENT OF STRICTURE AND URINARY FISTULA.

As a sound and scientific treatment of any disease can only be based upon a correct appreciation of the pathological process by which that disease has been produced; so a scientific treat-

ment of urinary fistula rests completely upon a clear understanding of the various causes by which such a complication of stricture has been brought about.

In another page I have explained the various modes in which a urinary fistula may be produced. It most frequently comes beneath our notice as a result of urinary abscess or of extravasation, but it may also follow upon an injury or upon any operative measure involving the urethra, as after lithotomy. Any obstruction of the urethra, whether the result of a contracting simple, or traumatic organic stricture, if allowed to go untreated, will end in a urinary abscess, or rupture of the urethra—these two being the usual means which nature adopts to find another outlet for the urine which is forbidden by the presence of a stricture to take its natural course. If this stricture is not dilated, and the urine is allowed for any period of time to find its way through the new and artificial channel, this may become permanent, and a so-called urinary fistula will be established.

Any laceration to the urethra, accompanied or followed by a perineal wound; any operation of lithotomy by which the urethra is freely opened, and through which an easier and more ready exit for the urine exists than through the natural channel, is also liable to be followed by the same complication, and thus to be another cause of perineal fistula. Let the cause of the obstruction be removed,—let the stricture be dilated, and the urethra rendered patent, and unless the new passage has become an established one by time and long habit as it were of the part, the fistula will close, and the natural condition of the parts be subsequently restored.

The form of stricture, however, associated with a urinary fistula, is generally of a severe nature. It has been already shown that a urinary abscess, or a more extensive extravasation of urine rarely takes place as a result of a simple organic stricture, unless the obstruction is very great; and as these complications are the ordinary precursors of a fistula, it is equally clear that the same association must practically exist.

The first object of the surgeon is therefore to treat and to cure the stricture, doing this with the confidence that if the natural calibre of the urethra can be restored there is a strong probability, although not certainty, of the fistula closing.

To do this, the principles of treatment which have been already laid down for uncomplicated stricture are to be applied to the treatment of this complication. Dilatation by means of instruments should not be neglected if the stricture is a permeable one, and will allow of the treatment being effectually carried out. If the stricture is very irritable or contractile, the practice which has been already indicated in an earlier page, is to be applied; and if the urethra is obliterated or impermeable, the same principles of treatment and practice are to be pursued as if no such complication existed; indeed, in the treatment of the case, the fistula may be disregarded.

The condition of the urethra is the one important point to which the attention of the surgeon should be directed. By treating and remedying its morbid conditions, he is adopting the only efficient means for the removal of the fistula, and this will, in all probability, disappear when that end has been attained. But in the majority of these cases the urethra is indurated and almost cartilaginous; the tissues of the perineum are gristly from old inflammatory induration; and the passage of the urethra is frequently completely obliterated, or so tortuous as to be practically impermeable; and if the cause of the stricture was an injury these latter conditions are most frequent.

I possess the notes of sixty-five examples of this complication, as a result of simple organic stricture, and in forty-seven or in 72·3 per cent., a cure was obtained by dilatation; in the remaining eighteen cases, either the operation of perineal section or of external division was found necessary.

I have also five cases as a result of traumatic stricture, but in two of them only was a cure obtained by dilatation; in three some perineal operation being absolutely called for.

These clinical facts are quite sufficient to show that the form of stricture with which this complication is connected is generally of a severe type, 27 per cent. of the cases requiring some operative measures for their relief; in four the urethra was permeable, but in the remaining twelve cases it was impermeable and obliterated, and when these figures are compared with those previously given of simple organic stricture, in which seven instances only out of 483, or 1·44 required any operation, the truth of the observation becomes very apparent.

The following cases may be quoted to illustrate the practice.

It is clearly unnecessary to quote cases of stricture and urinary fistula, in which the simple treatment by dilatation has been successfully employed, and I will therefore quote only a few examples of the severest forms in which some operative measure was required.

CASE.—*Stricture ; perineal fistula of five years' duration ; external division of stricture ; recovery.*—Charles R—, æt. 40, a healthy sailor, was admitted under the care of Mr. Birkett, with a perineal fistula of five years' duration upon a simple organic stricture of thirteen years' standing ; nearly the whole of the urine passed through the perineum, and the stricture was rarely permeable.

It was clearly almost beyond the bounds of possibility, for a case of this description to be treated by simple dilatation ; the urethra at times only admitting the passage of an instrument, and the fistula being of such long standing.

Chloroform was therefore given, and the operation of "external division" or Syme's operation performed, a catheter being introduced and left in for two days ; everything went on well ; the fistula healed, and the man left the hospital quite well.

CASE.—*Contractile stricture ; perineal fistula ; Syme's operation ; recovery.*—T. S—, æt. 35, was admitted under the care of Mr. Cock with a perineal fistula of two years' existence following a stricture of eight years' duration. A No. 1 catheter could be passed through the stricture, and the stricture dilated, but immediately upon the omission of the treatment it re-contracted. The operation of "external division" was consequently employed, and the man left cured in six weeks.

CASE.—*Stricture ; perineal fistula ; extravasation of urine ; perineal section ; recovery.*—Robert A—, æt. 43, a healthy labourer, was admitted under my care with extravasation of urine, and perineal fistula, which had existed for three years, symptoms of stricture having been recognised for four.

The operation of perineal section was performed, and the stricture divided, a staff having been previously forced through the stricture after the perineum had been opened. Gradual

convalescence followed; and as one of the perineal openings of the fistula was obstinate in healing, its surface was rendered raw by the application of some liquor ammonia fortius. This answered its object, and the fistula closed; the man leaving the hospital quite well.

In some instances the urethra is completely obliterated, and the surgeon is quite unable to restore the canal; under these circumstances there is but one object to be obtained, and that is to make a free opening in the perineum, and to render it permanent, allowing the other tortuous fistula to heal. In the following case such a treatment was carried out.

CASE.—*Obstructed urethra; perineal fistula; perineal section; artificial opening rendered permanent.*—George P—, æt. 50, was admitted under the care of Mr. Coek, with an obliterated urethra, and many perineal fistula of two years' duration. All attempts to pass an instrument were completely foiled, although constantly repeated. The operation of "perineal section" was therefore performed, and a large catheter introduced through the wound into the bladder, and left in; this opening was therefore rendered permanent, the other fistula healed, and the man left the hospital with the natural passage apparently obliterated, as no urine ever passed, and micturating freely through the new and artificial passage.

CHAPTER XXXVIII.

ON TRAUMATIC STRICTURE.

THE difference in the cause, the difficulties in the treatment, and the permanency in the nature of a so-called traumatic stricture, has led me to separate the cases thus denominated from that larger class which we have been just considering—the result of a local inflammation.

I possess the notes of forty-three examples of organic stricture, which may, without doubt, be fairly ascribed to the effects of a local injury. In all of them a distinct history can be

obtained of some definite accident affecting the perineum, the blow or fall being immediately followed by hæmorrhage from the urethra, with or without other symptoms, and at a later date by difficulty in micturition.

These accidents, as a rule, take place in boyhood or in young adult life, but no age is free from the dangers of such an injury. The kick of a man or horse in the perineum, a fall upon a pointed instrument, or across a bar, beam, or rail; an injury from a saddle when riding, the blow of a rope, and sloughing of the perineum after a violent contusion, are the principal causes to which the stricture has been assigned in the cases before me. In one and all there was clear evidence, at the time of the injury, that the urethra was more or less involved, as hæmaturia in almost every case immediately followed, and difficulty in micturition appeared at variable intervals after the receipt of the primary injury. In some few cases several years had passed away before the attention of the patient was called to the smallness of his stream of urine, and then, in a large proportion of the cases, some sudden attack of retention was the first symptom which attracted notice; but in the majority of cases the difficulty in micturition appeared rapidly after the receipt of the primary injury, and went on slowly but surely to increase.

The pathology of these cases is not difficult to understand; the urethra, by the injury, is either partially or wholly ruptured; the wound being transverse, union subsequently takes place, and it is the contraction of this cicatricial tissue in subsequent years that produces stricture. It is this pathological fact which enables us to explain the obstinacy of the symptoms and the difficulty in the treatment.

Complications.

As in other cases of organic stricture, these traumatic examples are equally liable to be followed by like complications. The complications are the result of the obstruction to the urethra, and it is of little consequence in what way that obstruction may have been primarily caused. Amongst my forty-three examples of traumatic stricture, there are twenty-

seven cases admitted simply on account of their contracted stream and difficulty in micturition. In eight cases retention of urine was the immediate cause. In three, extravasation of urine, and in five urinary fistula complicated the cases.

Treatment of Traumatic Stricture, and its complications.

There are no cases of organic stricture, complicated or non-complicated, which are more obstinate in their treatment than the so-called traumatic. The nature of the obstruction being cicatricial, is quite enough to account for this fact, as it is well known that all cicatrices have a constant and almost perpetual tendency to contract. A traumatic stricture—the result of a contracting cicatrix—is in its nature essentially a contractile stricture, and in its treatment it is no less troublesome, for if treated by dilatation it will recontract, and even if treated by perineal section or external division, it is far more likely to return than any form of inflammatory stricture.

All forms of treatment are consequently uncertain and unsatisfactory. If dilatation of the urethra is once secured, a constant introduction of the catheter is most essential, or otherwise it is certain to recontract; and if it is a question whether any case of simple inflammatory stricture is ever really cured, it may unquestionably be asserted that every case of traumatic stricture will exist for life, and will require constant and repeated treatment to preserve even a moderate patency of the narrowed passage. The principles of treatment in both varieties, however, are the same, although the practice may not be so successful.

If the urethra be permeable, the treatment by dilatation should be primarily employed, and this must be persevered in for some time, if success is to be secured. If the stricture is so narrow and indurated as to refuse to be dilated, and a grooved staff can be passed through, the operation of external division is the soundest practice, such an operation giving the surest hopes of immediate and future benefit.

If the stricture be impermeable, and from its narrowness should require treatment; or from its complications, either of extravasation or urinary fistula demands attention, the

perineal section must be carried out, the same method of its performance being applicable in these as in former cases.

If extravasation of urine be present as a secondary result of this traumatic stricture, the same principles and practice which have been advocated in the treatment of simple organic stricture are equally applicable; as are also the recommendations which have been made for the treatment of perineal fistula.

The permanent success, however, of the practice in these traumatic cases, is not nearly as great as it is in the inflammatory, although the practice in both is really the same. It is hardly necessary to illustrate these facts, the experience of all surgeons will bear them out.

To show the greater severity of these cases, and the difficulties of their treatment by dilatation, it may be stated that out of the forty-three examples of traumatic stricture which have been tabulated, in six the operation of perineal section or of external division was absolutely required, or 14 per cent. of the whole number; whereas, amongst the cases of simple organic stricture, but 6 per cent. required operative interference, the simple treatment by dilatation answering every other purpose.

CHAPTER XXXIX.

GENERAL SUMMARY ON "PERINEAL SECTION," AND "SYME'S OPERATION."

THE materials upon which the remarks in the preceding pages have been based will surely be deemed amply sufficient by all surgeons to warrant the conclusion, that the operations of "perineal section," or of "external division," known as Syme's operation, are not required in a large proportion of the cases of stricture; it having been shown that in at least 94 per cent. of the cases of simple organic stricture admitted into Guy's Hospital, that the treatment by dilatation has been found

to have been all that was required. The severer cases only, which refused to be successfully treated by the simpler treatment, or which were so complicated with other symptoms as to forbid its application, requiring any operative measure.

In the exceptional cases of simple stricture, and in the complicated examples which come before our notice, these perineal operations are doubtless of great value; and it may not be without interest to draw some practical conclusions, by way of summary from the preceding pages, concerning the class of cases in which they are to be applied, and as a preliminary conclusion it may be asserted—

1st. That in any case of stricture requiring operative measures, the operation of "external division" is to be selected, whenever it can be applied, in preference to the more difficult and uncertain operation of "perineal section."

2nd. That in those cases of stricture which are *permeable*, and in which, therefore, a grooved staff can be passed, it has been shown that in only exceptional cases are any operative measures called for; in the cases upon which the remarks have been based, the operation was required only in 1.44 per cent., or hardly $1\frac{1}{2}$ per cent.

3rd. That the very irritable and contractile strictures are the only cases of permeable stricture requiring such treatment.

4th. That in strictures complicated with urinary abscess, or with extravasation, in which some free incision is always demanded to give exit to the pus or extravasated urine, the best and most scientific practice is to divide the stricture at the same time; the operation of external division of the stricture being selected when a grooved staff can be passed—and of perineal section when it cannot.

5th. That in strictures complicated with perineal fistula, operative measures are only required when simpler means have failed. If the stricture be a permeable one, the operation of external division is only called for under the same conditions which have been held to be sufficient to demand such measures when no such complication existed; when connected, however, with impermeable or obliterated urethra, the operation of perineal section is of great value.

6th. That in *traumatic stricture* these operative measures are required at least twice as frequently as they are in the

simpler cases. The same principles of treatment are applicable, however, to both cases; but as impermeable and obliterated urethras are more common as a result of injury, the operation of perineal section is most frequently required.

Analysis of Cases.

My notes furnish me with forty-three examples of "perineal section" and external division, seven of which subsequently died, or 14 per cent.

Cases of External Division or Syme's Operations.

- 7 cases of external division for irritable and contractile strictures, one of which died from renal disease and uræmic poisoning.
- 5 " of external division for stricture and extravasation, all of which recovered.
- 4 " of external division for stricture and perineal fistula, all of which did well.
- 3 " of external division for traumatic stricture or its complications, all of which recovered.
- 19 " in all of external division, in one only of which was there a fatal result, or 5 per cent.

Turning to the cases of *perineal section*, it will be seen that there were operated on :

- 5 cases for stricture and extravasation, one of which died.
- 14 " for stricture and perineal fistula, two of which died.
- 3 " for traumatic stricture and complications, two of which died.
- 2 " for obstructed or impermeable urethra, one of which died.
- 24 " in all, six of which died, or one fourth, or 25 per cent. Patients dying after this operation of perineal section five times as frequently as they do after the operation of external division.

It must not, however, be concluded that the risks of the operation of "perineal section" are much greater than are those of "external division." I imagine no such real difference exists; that in skilful hands the dangers of either are not great, and that no patient dies from the operation itself, but that the difference in the mortality depends entirely upon the severity

of the stricture, but more particularly upon the secondary complications and effects which result from it.

In cases of permeable stricture, complicated or not, that is, in cases in which the urine can pass, although it be with difficulty, it is evident that the bladder and kidneys are much less liable to become diseased than they are in other cases in which the urethra is really obliterated, or at any rate impermeable. In these bad examples the urinary viscera are almost certain to be in a worse condition than they are in cases of permeable stricture, and, as it is in these bad cases that the perincal section is alone required, the increased mortality of the operation is clearly explained.

When I proceed to consider the causes of death in stricture these points will be more clearly shown, but for my present purpose the above remarks amply suffice.

CHAPTER XLV.

ON INFLAMMATORY AND SPASMODIC STRICTURE, RETENTION OF URINE, ETC.

ALTHOUGH retention of urine must be regarded as a complication of stricture; it is, in reality, only a symptom, and in a large proportion of cases of stricture it is the first one by which the attention of the patient is directed to the part, and by which a stricture is positively made known. It is a symptom also which will not be disregarded, and from its urgency, and from the necessity of prompt and definite treatment on the part of the surgeon, I have thought it well to give it a separate consideration.

As a symptom and complication of organic stricture it has been already stated that it appeared in 129 out of the 603 cases of simple organic stricture admitted into Guy's Hospital, and in five out of the forty-three of traumatic stricture; it was present also in many of the cases admitted with extrava-

sation of urine, but the latter complication was the most important, although in the treatment the retention may have been the symptom of primary interest.

I possess the notes, however, of eighty other cases of retention of urine, produced by various causes and under various conditions. I propose, therefore, to proceed at once to its consideration, reserving the treatment of retention from organic stricture for a later page.

Spasmodic Stricture.

As a symptom and result of simple spasmodic stricture, retention of urine has been tabulated in forty cases, that is, forty patients have been admitted with retention of urine, in whom no symptom existed of organic stricture. In almost all, excess of drinking, with or without exposure to wet and cold, were the exciting causes, and no complication aggravated the cases.

This number includes patients of all ages; one boy being only ten years old, who paid the penalty of a drinking bout by experiencing the pain of a severe retention. The passage of a catheter was readily performed and relief given, no mechanical obstruction existing.

The fact that true spasmodic stricture exists is no longer a subject of doubt; that the seat of the stricture is also the membranous portion of the urethra which is encircled by muscles is also now generally acknowledged; and that the usual exciting causes of such a stricture are exposure to wet or cold, and excess in drinking, are clinical truths which the notes of the forty cases before me clearly prove; anything, however, which can induce an altered or acid state of the urine, is likely to be followed by this complication; gouty and rheumatic patients being particularly prone to such attacks. The *treatment* of these cases is not complicated; the simple passage of a large metallic catheter is the most expeditious and certain practice. The instrument should be well warmed and freely oiled; it is to be passed slowly so as not to excite alarm or increase the spasm of the muscles; and in skilful hands its introduction is not an operation of difficulty. If, however, the

operator should be foiled in his endeavours, he must be cautious not to employ force; it is never required, and never justifiable. *Chloroform* should then be administered, and with a patient fully under its influence all obstruction ceases, and the instrument will slip in. If there is an objection to the use of the anæsthetic, the old remedy of a *hot bath* is one which cannot be too highly extolled; few patients suffering from simple retention failing to micturate when thus immersed, and the introduction of a catheter is much facilitated. A *full opiate* is also an invaluable remedy, relieving the involuntary contraction of the bladder, which is so painful in cases of retention, and thus removing one of the most constant causes of spasmodic stricture. The value of opium in these cases cannot with some surgeons be too highly extolled, leading them to assert that there is no case of retention of urine which will not yield to its benign influence, allowing either a natural relief or the introduction of a catheter. I am not disposed to go quite so far in this opinion, although the evidence of experience is generally in its favour, and in cases of retention it acts sometimes as a charm.

The inhalation of chloroform, however, is a preferable remedy, its action being more rapid and more certain.

Should failure, however, follow the application of these means, other measures must be adopted, and without doubt the simplest, safest, and most expeditious practice, is the puncturing of the bladder through the rectum, but this operation will receive from us a separate consideration.

Inflammatory Stricture.

In the consideration of the subject of spasmodic stricture, which practically comes under the notice of the surgeon, as cases of retention of urine, it has been shown that exposure to wet or cold, an altered condition of the urine, produced either from excess of drinking, gout, or rheumatism, are the chief exciting causes of an attack of retention; and if this be the case there can be no difficulty in understanding that an equal result may be brought about, and is more liable to be experienced if the urethra itself should be the seat of an inflammatory action. Retention of urine at times

comes before our notice as a result and concomitant of gonorrhœa, and I possess the notes of several cases in which patients were admitted with retention of urine, from this common disease. The causes of the retention are evidently compound, spasmodic stricture added to the mechanical obstruction produced by the œdema of an acute inflammation combining to produce the result.

The *treatment* which is therefore required to afford relief, must be based upon the appreciation of these two conditions which have combined to cause the effect. The retention is in a measure mechanical, and must be met by mechanical treatment; it is also functional, and as a consequence must be so considered.

The symptoms are urgent, therefore time is a great object; and if called to a case there are few surgeons who would not at once attempt to pass a catheter; let him choose an instrument of a medium size, No. 4 or 5 being the best; let it be well warmed and well oiled, and then with gentleness and yet firmness the obstruction may be overcome; *arte non vi* must be the guide of his action, as force is to be condemned in these cases as much as it was in the preceding.

If these means fail, a hot bath, and full opiate, are the soundest remedies. They relieve the local turgescence of the passage, and therefore the obstruction, and with it the associated spasm. The use of chloroform in these cases cannot be recommended, as it merely relieves the spasm but does not alter the condition upon which the spasm depends, viz., the inflammation. If these means fail, which is not common, some operative measure may be required, which will be dwelt upon in another chapter.

Retention of Urine following a blow in the Perineum.

Under this heading it is not my intention to allude to the cases of ruptured urethra. Retention of urine may certainly be a prominent symptom of such an accident, but the severity of the case upon which the retention depends causes the symptom to be regarded with less attention, but this condition will meet with our consideration in another chapter.

But as a result of simple contusion in the perineum, cases

of retention may appear before us. I possess the records of three such examples—two in children aged three and seven, respectively, and one in an adult aged twenty-nine; in all a simple contusion in the perineum was the assigned cause. No hæmorrhage or other symptoms of a ruptured urethra could be made out; it may then be fairly asserted, that the retention was the result of the contusion, and was caused by some spasmodic condition of the passage, excited by the injury. In all the cases, the simple passage of a catheter was the only treatment, and with the relief of the symptoms convalescence followed.

In one other instance, however, catheterism was impossible; many attempts had been made without success, and, as a consequence, the bladder was punctured per rectum, with immediate relief and a subsequent cure.

Retention of Urine from the pressure of an Abscess in the Perineum.

This complication must be quoted, as cases of retention from such a cause occasionally come under the surgeon's notice. I possess the records of three examples of the kind; in neither could any assigned reason for the appearance of the abscess be obtained. There was no stricture, or urethral disease, neither had the patient received any injury. The mechanical pressure, however, of the abscess caused retention, and this was relieved when the abscess had been opened; in all three instances recovery immediately followed. It is sufficient to allude to the fact that retention of urine may be produced by the pressure of an abscess in the perineum, the treatment and relief of which is an obvious point.

Retention of urine from paralysis of the bladder from any cause, situated either in the organ itself, or associated with spinal disease, is a common cause of retention, and the same complication may be found with fever or any other constitutional condition in which the vital powers of the patient have been much reduced, and the nervous system has, as a consequence, become unable to answer to its accustomed stimulus: as an associate, or rather symptom of peritonitis—local or general, traumatic, or, as a result of some other abdominal

disease, retention of urine has passed beneath our notice. It is enough, however, for the surgeon to remember that this complication may be produced by the causes enumerated, to prevent any error being perpetrated. The cautious introduction of a catheter is palpably the correct practice.

It is not, however, as a case of retention of urine, that the attention of the surgeon is, as a rule, directed to such cases as have been just alluded to. An incontinence of urine is generally the form of malady which attracts notice, and it is from this that the surgeon rightly infers that a case of severe retention of urine is before him, the incontinence being merely the overflow of an already overdistended and paralysed bladder.

The symptom of incontinence is a very positive one, and should never mislead any practitioner. It is almost always a concomitant and result of retention, and should be so regarded—at any rate until the surgeon has convinced himself, by a careful examination, that the bladder is not distended.

Retention of Urine as a symptom of enlarged Prostate.

It has been a common opinion, held by all surgeons for many generations, that an enlarged prostate is a very general condition of old age, and that retention of urine as a consequence, and as a symptom of this affection is of frequent occurrence. The investigations of recent pathologists, and more especially of Mr. Henry Thompson, have been to show that such an opinion is by no means true; that an enlargement of the prostate, either as an hypertrophy, or from the development of independent prostatic glandular tumours may take place, and, that when they do, it is most commonly met with in old people, but that such conditions are by no means to be considered as senile changes.

When retention of urine takes place in old people in whom no stricture exists, it is too frequently ascribed to this chronic enlargement of the prostate, and as it is really a rare thing to find in the bodies of those that die such a condition, it is fair to believe that this retention is due to other causes. It does not, however, enter into my present intention to discuss this subject, and I must, therefore, be content with the

remarks just made. I possess the notes of twenty-four examples of retention of urine, in which the enlarged prostate was supposed to exist; they all occurred in old men:

3 being between 50 and 60 years of age.			
8	"	60 and 70	"
8	"	70 and 80	"
5	"	80 and 90	"

In all, the simple introduction of a large catheter afforded relief. This operation should always be undertaken with great care, as an injury to the prostate or bladder in old people is of considerable consequence. An elastic instrument in the hands of those who are not in the constant habit of using instruments, is to be preferred, and this may be passed slowly down to the neck of the bladder. It is at this point that the difficulty in its introduction is always experienced; but if the index finger of the surgeon's left hand be introduced into the rectum, and the end of the instrument tilted upwards, by the slightest pressure with the right the catheter will, as a rule, be readily passed onwards, and relief secured.

In all the cases which I have before me this result was secured, and in no one instance did any bad result follow. The relief in many cases is only temporary, as the condition which caused the symptom still remains; but neither medical nor surgical treatment is of any permanent use when a general enlargement of the gland really exists.

Retention of urine may also be produced by an abscess situated in the prostate gland, and the retention is only relieved when the abscess has been opened. This treatment is, therefore, the one which should be followed.

Retention of Urine as a result of an elongated and adherent Prepuce.

It is a somewhat inexplicable fact that surgical writers have, with rare exceptions, omitted to notice that an elongated prepuce and adherent glans penis to its mucous membranous covering is capable of producing retention of urine, with every symptom of vesical irritation; yet, few surgeons can have had any experience at any hospital or dispensary without seeing

many such examples, all of which are immediately cured by the removal of the cause. Cases illustrating this fact are not admitted into our metropolitan hospitals, but from my note-book of the out-patient department I could bring forward numerous cases illustrating these points. I could quote cases in which an adherent prepuce had been the cause of retention of urine, and of incontinence of urine, in which it had produced symptoms of irritable bladder, and every other symptom of vesical calculus, even a hæmaturia. Prolapsus recti is by no means an uncommon result of such an affection, and in one case of a child three years old constant priapism existed. An adherent prepuce to the glans penis was the sole cause of all these symptoms, as proved by the fact that they immediately disappeared when the cause had been removed.

These cases all take place, or nearly all, in early life, and I never see a case of vesical irritation in children without first examining the condition of the penis. For some years I have been in the habit of pointing this fact out to students, and have always directed them when examining a child suffering from any supposed urinary disorder to take into consideration the condition of the penis before passing onwards to examine other parts, with the probability that in at least two thirds of the cases passing under observation suffering from urinary irritation, an adherent and elongated prepuce is the sole cause. Circumcision and the careful separation of the prepuce from the glans penis, with the removal of the confined secretion of Tyson's glands is the only remedy; it is a simple one, and is most complete.

The connection between this condition and the symptoms enumerated is not sufficiently taken into account, but the facts as given are correct, as they are based upon the records of cases which are now before me.

Retention of urine as a symptom of ruptured urethra will receive attention in another page.

CHAPTER XLI.

ON RETENTION OF URINE FROM ORGANIC STRICTURE.

AMONGST the many contingencies to which a patient suffering from stricture is continually exposed, there is no one which causes more agony and alarm to the sufferer, or which demands more prompt and decisive action on the part of the surgeon, than an attack of retention of urine.

This retention of urine may be the result of a slowly contracting organic stricture; but it will probably be produced by some sudden accession of spasm of the muscles of the passage, and thus be compound in its nature, a spasmodic stricture being grafted upon an organic. The symptoms, however, are necessarily urgent, and it becomes an important question of what practice is to be pursued. With this object it will be of interest to inquire, first of all, what practice has been proved of value? and, as a means to the solution of the difficulty, I can show that out of 129 examples of simple organic stricture suffering from retention, 109 were successfully treated by means of catheterism, warm baths, and opium; and in twenty cases only, or in 15·8 per cent., were any other operative measures called into requisition. In all of these twenty examples the bladder was punctured per rectum, with complete success.

Out of eight cases, also, of retention of urine produced by the gradual contraction of a *traumatic* stricture, five were treated by means of catheterism; and in the remaining three the bladder was required to be punctured; the proportion of cases requiring such an operation for its relief in traumatic stricture being much greater than in the preceding class of simple organic; the causes of this difference being very apparent. With this brief analysis of materials before me, I will proceed at once to consider what treatment is to be pursued in a case of retention of urine with simple organic or traumatic stricture. If a surgeon is called to a patient suffering under the agonies of a retention of urine, produced either by a simple spasmodic stricture or an inflammatory stricture, as it has been already explained that relief is to be obtained by the cautious intro-

duction of a catheter, aided, if required, by the use of the warm bath, or a full dose of opium; and, in certain cases, by the inhalation of chloroform.

If these means should fail, as the results of experience prove may be the case, either from some peculiarity of the stricture, or from the manner in which the treatment has been carried out, other measures will necessarily be called into requisition; and it has been already stated that the best and most expeditious practice is to puncture the bladder through the rectum. It is true that this practice is rarely needed in simple spasmodic stricture, and in inflammatory stricture; the means already suggested being, in the majority of cases, amply sufficient to secure relief; nevertheless, in the exceptional instances this operation is of great value, and I possess the notes of cases illustrating the fact. It must be remembered, however, that the practice is only called for when simpler means have failed. But when this difficulty is experienced the operation is to be performed.

In the treatment of retention of urine with simple organic or traumatic stricture, the same principles of practice are to be applied as have been recommended in the former class of cases; and in a large proportion of instances it has been already shown that success by such treatment may be secured; for, out of 137 cases of retention admitted into Guy's, operative measures were required in only twenty-three. The simple introduction of a catheter, with the aid of warm baths and the internal administration of opium, proving sufficient to carry out all the objects to be obtained, and relieving the retention. If the surgeon is called, therefore, to a case of retention of urine with organic stricture, the introduction of a catheter is the primary means to be employed. If the history informs him that the retention is the result of a gradually contracting passage, a medium-sized instrument should be selected, and, on this failing, a second attempt with a smaller one may be followed by success. Force, however, is not to be employed, and too much time is not to be expended in making the attempt; if success is to follow the operation, it will readily be obtained; perseverance and repeated endeavours to pass an instrument, as a rule, do harm. If the symptoms are not very urgent, and some delay may be allowed, the warm bath and a full

opiate, such as two or even three grains of opium, may be employed; and, under their combined influence, it will be only in the exceptional cases that relief will not subsequently be secured—the patient either micturating with his own free will, or the introduction of a catheter will be rendered possible.

If the symptoms of retention are, however, very urgent, and the agonies of the sufferer demand immediate relief; or, if the means which have been just described have been fairly tried, and have been found wanting, there is little doubt that the practice which is most scientific, and most certain, is the puncturing of the bladder through the rectum; for all experience has correctly endorsed the opinion which was expressed by Mr. Coek, when he recalled the attention of the profession to this operation, in his valuable paper, published in vol. xxxv, of the ‘*Medico-Chirurgical Transactions*,’ “that the bladder may be reached with the smallest amount of pain, with the least risk of present or future danger, and with the greatest prospect of ulterior good by puncture through the rectum.”

The records of the twenty-three cases of this operation which I possess positively prove, if further proof be necessary, the truth of this opinion, and it is gratifying to find that in these days, the majority of surgeons recognise the value of the practice.

The operation is as simple as it is safe; it is as efficient as it is scientific; and as a means of relieving any patient from the agony of a retention of urine which has been proved to be irremediable by the *rational* use of catheters, it stands unequalled. By its adoption all forcible catheterism, with its dangers, are dispensed with. Perineal section and its difficulties, as a remedy for retention, are done away with; and the operation of puncturing the bladder above the pubes may nearly be forgotten. The operation of puncturing the bladder through the rectum embodying in itself all the advantages of all these means without any of their evils; and on practical grounds, as well as on scientific, it commends itself for our adoption.

I would add, therefore, as a final conclusion:—“That in all cases of retention of urine from stricture, in which relief cannot be given by means of rational and not forcible catheterism, and in which the use of the warm bath and opium have fairly failed, the operation of puncturing the bladder through the rectum is to be performed.”

I will now proceed to quote briefly a few examples illustrating the practice which has been advised.

Cases of Stricture in which the operation of puncturing the Bladder through the Rectum was performed.

CASE 1.—*Retention of urine from traumatic stricture.*—W. B—, æt. 57, when seven years of age received an injury to his perineum for which he was laid up some time. He experienced, however, little difficulty in micturition till seven years ago, when he had an attack of retention of urine which was relieved by the introduction of a catheter; since that date he has had symptoms of stricture. He was admitted on August 2nd, 1857, under the care of Mr. Birkett, with retention, for which catheterism completely failed. His bladder was therefore punctured; on the thirteenth day urine first appeared through the urethra, in a fair stream; the canula therefore was withdrawn, and gradual improvement followed; the man leaving convalescent.

CASE 2.—*Retention of urine from traumatic stricture.*—W. S—, æt. 43, was admitted under the care of Mr. Cock, with retention of urine following upon a gradually contracting stricture, the result of an injury sixteen years previously. Catheterism failing to give relief, the bladder was punctured. On the twelfth day the man passed his urine in a fair stream, and as this daily improved the canula was removed on the fifteenth day. Nine days subsequently a catheter was introduced though the stricture, which was then readily dilated. The opening in the rectum ceased to allow the passage of urine eighteen days after the canula had been removed. The man left cured.

CASE 3.—*Retention of urine from simple organic stricture, with disorganization of the urethra from forcible catheterism.*—Jo. A—, æt. 20, was admitted under my care on December 5th, 1860, with retention of urine following upon a stricture which had existed many years. Before admission violent catheterism had been employed, and on examination

with an instrument, the canal appeared to be completely disorganized. I accordingly punctured his bladder, and on the fifth day urine passed through the urethra; the canula was therefore removed. The stricture was subsequently dilated, but the man left before the treatment was completed.

CASE 4.—*Retention of urine, with gradually contracting organic stricture.*—C. S—, æt. 56, was admitted on July 13th, 1860, under the care of Mr. Cock. He had been the subject of a stricture for twenty-six years, and was in great pain from retention of urine. Catheterism being impossible, the bladder was punctured, and three pints of urine drawn off. On the sixth day a catheter was passed; the canula was therefore taken out; dilatation of the stricture was subsequently secured, and the man left cured.

CASE 5.—*Retention of urine from organic stricture.*—J. D—, æt. 25, was admitted, October 13th, 1855, under the care of Mr. Birkett, with retention of urine of two days' duration, upon a stricture which had caused symptoms but one year. The bladder was very large and reached up to the umbilicus. Careful catheterism, aided by the warm bath and opium completely failing, the bladder was punctured; on the fourth day urine passed through the urethra, and the canula was withdrawn. Dilatation was then continued, but the man left before he was cured.

CASE 6.—*Retention of urine from organic stricture, and disorganized urethra from forcible catheterism.*—G. T—, æt. 35, was admitted, September 15th, 1859, with retention of urine and stricture, which had existed for six years; frequent and forcible catheterism, prior to his admission, had failed to give relief, and the urethra appeared to be disorganized. Mr. Birkett, therefore, punctured the bladder, and drew off a quart of dark-coloured urine. On the second day urine passed in small quantities through the urethra, and, by the sixth, it came in a good stream; the canula was, therefore, withdrawn, and the man left the hospital cured; the stricture readily yielding to dilatation.

CASE 7.—*Retention of urine and impermeable organic stricture.*—C. W—, æt. 48, the subject of an old stricture of ten years' duration, was admitted under the care of Mr. Birkett, on November 12th, 1857, with retention. Catheters had been freely used before his admission, and the passage was quite impermeable to any fair means. Mr. Galton, the house-surgeon, therefore rightly punctured the bladder, and drew off a quart of urine. On the third day, the man passing his water the natural way, the canula was withdrawn. The treatment by dilatation was followed up, and recovery ensued.

CASE 8.—*Retention of urine and organic stricture.*—C. S—, æt. 34, was admitted under the care of Mr. Birkett, on August 31st, 1856, with retention supervening on a stricture of fourteen years' continuance; violent catheterism, warm baths, and opium, failing to give relief, the bladder was punctured, and four pints of urine drawn off. On the third day the man passed water the natural way, and, on the fifth, the stream became good. The canula was therefore removed, and a No. 5 catheter introduced; everything progressed well, and recovery followed.

Remarks.—It is hardly necessary to continue the quotation of the cases which lie before me; all tell the same tale. In the twenty-three examples relief was readily secured by the operation, and in no one instance did any evil result follow from its practice. The experience fully bears out the opinions which were expressed in a previous page, and the cases given are good types of others which might be quoted.

The instruments employed in these cases were those which were originally introduced by Mr. Cock; they are simple in their construction and answer every purpose, but are too well known to require description.

CHAPTER XLII.

THE CAUSES OF DEATH FROM STRICTURE.

THERE are few simple local diseases which, if neglected, have a more fatal tendency than urethral stricture; and there are certainly none in which the progress towards evil can be so accurately and clearly traced. The portion of the urethra situated behind the stricture is the part which primarily experiences the evil influence of the obstruction; the bladder becomes subsequently involved, and last, but not least, the ureters and kidneys. The importance of the kidneys in the animal economy as excretory organs becomes, consequently, most apparent, and the fatal effect of disease in their structure is too clearly demonstrated.

To assert that renal disease is the sole cause of death from stricture would not, perhaps, be strictly true; nevertheless, it is the principal cause, and if these glands are not involved, stricture and its complications are not fatal. This fact is tolerably clearly proved by the cases before me.

Simple uncomplicated stricture is not a fatal disease, few cases terminating in such a way.

Stricture and retention of urine is a far more serious combination, and stricture with extravasation of urine is still more fatal; the accuracy of these remarks being fairly proved by the following analysis of 646 cases.

Analysis of Cases.

Out of 345 cases of simple organic stricture treated by dilatation, 9 only died, or 2·6 per cent.

„ 129 cases of stricture and retention of urine, 6 died, or 4·6 per cent.

„ 45 cases of stricture and extravasation, 15 proved fatal, or 31·1 per cent.

Of the 37 cases of organic stricture requiring some operative interference, whether simple or complicated, 16 were cases of external division of the urethra, 1 of which only died, or 6 per cent.; whilst of 21 cases of perineal section, 4 died, or 19 per cent.

Taking the whole number of 603 cases of simple organic stricture, 36 died, or about 6 per cent.

Of the 43 examples of traumatic stricture, 2 died, or hardly 5 per cent.

It would thus appear that it is only when stricture has

existed for a lengthened period, and has become complicated, that its fatal influence becomes apparent; the increase in the mortality of the cases increasing with the severity of the complication.

Reviewing, therefore, the thirty-six cases in which a fatal result took place—

9	were cases of simple organic stricture.
6	„ stricture and retention.
15	„ „ extravasation.
1	„ „ fistula.
5	„ requiring external division or perineal section.

In twenty-six of these cases a post-mortem examination was made, and, in all, diseased kidneys were discovered; not such disease as requires microscopical research for its detection, but positive destructive and suppurative disease of the organs, more or less extensive.

In two of the remaining cases the patients sank with evident symptoms of uræmic poisoning, and in the other eight that peculiar exhaustion which appears so characteristic of renal disease was most marked. It is an exhaustion which remedies and stimulants fail to relieve even for a time, and which is too certainly the precursor of death.

The duration of the stricture has necessarily a serious influence in producing a fatal result; the longer the obstruction exists the greater the probability, if not certainty, of renal affection being produced.

In the cases before me the average duration of the stricture was seventeen years; five cases only having shown symptoms under ten years, and ten for upwards of twenty years.

Under these circumstances it becomes almost a certainty that disease of the kidneys has been produced, and that the slightest injury or accession of mischief would terminate in death; for I imagine that every person the subject of renal disease stands, as it were, continually on the edge of a precipice, and that the slightest adverse wind would send him down. This fact explaining the death of so many cases of operations, whether upon the urinary organs or on other parts; no patient with renal disease being able to resist the slightest tax upon his powers, vital energy sinking irrecoverably upon the receipt of the most trifling injury.

CHAPTER XLIII.

ON RUPTURED URETHRA.

THE secondary effects of an injury to, or a rupture of the urethra has already met with consideration under the heading of traumatic stricture; and it has been shown that in at least 6·65 per cent. of the cases of organic stricture an injury was the assigned cause; it has also been shown that the worst and most intractable cases of stricture are the result of injury, and that the majority of examples of obliterated urethras are the product of the same cause. In the present chapter I propose to consider the subject of ruptured or injured urethra together with its immediate effects and treatment. I possess the records of nineteen examples of this form of injury, and amongst them will be found cases sufficient to illustrate every point.

In the majority of instances the injury was caused by some direct violence applied to the perineum, such as a fall astride a post, plank, fence, or chair; and a blow or kick is another cause which must be mentioned; but in some instances the injury has been produced by the passage of a cart wheel across the pelvis. It is somewhat difficult to understand how such a result can be produced by such a cause, unless some fracture of the pubic portion of the pelvis coexists; but explain it how we may, in practice we meet with cases of ruptured urethra following upon the passage of a wheel across the pelvis, and unconnected with any other symptom of its fracture.

The characteristic symptom of a rupture or laceration of the urethra is the passage of blood; the blood appears usually as an immediate result of the injury, and may be little in quantity or profuse; it is seldom, however, so profuse as to endanger life, and as a rule the hæmorrhage subsides without treatment. If the injury has not been severe, it is just possible that this symptom is the only one by which the laceration of the urethra can be recognised; and if some time is allowed to elapse between its receipt and the calls of nature

to relieve the bladder, micturition may be completed with little or no difficulty, and convalescence be re-established.

It is not often, however, that the subject of a lacerated or ruptured urethra escapes so easily, for in the majority of cases a retention or extravasation of urine is the result, and it is for the relief of one of these complications that the advice of the surgeon is generally sought.

If called, therefore, to a patient who has evidently been the subject of an injury to the urethra, suffering from simple retention, the first object of the surgeon should be to attempt to pass a catheter; if the urethra is not completely torn away, and there is not much blood locally effused, there will be a strong probability that he will succeed, and having done so, the instrument should be left and fastened in; a gum elastic instrument, therefore, with a strong stilette, should be employed. If the attempt at catheterism, although having been fairly made, should fail, some other means must be employed, for it is clear that an outlet for the urine must be obtained, or otherwise extravasation, with its danger, will necessarily follow.

An incision into the perineum with a grooved staff is unquestionably the soundest practice; by it the extravasated blood, and urine if it exists, finds a ready outlet, and the bladder when it contracts will find a vent for its contents, without the dangers occasioned by an extravasation of urine.

If the orifice of the vesical end of the ruptured urethra can be found with a grooved probe, a catheter should be passed, the instrument having been first introduced through the penis, and subsequently guided upon the grooved probe into the bladder; if difficulty is experienced in finding the orifice, there need be no alarm, as it is quite clear that the urine will readily find its way externally through the artificial wound; an early attempt to pass a catheter should, nevertheless, certainly be made, for it is most important that the continuity of the urethra should be restored as early as possible.

When a catheter has been introduced, it must be left in; for it is equally important that the patency of the canal should be maintained during the whole period of its repair, and its subsequent contraction in a measure neutralised. The frequent passage of an instrument after the repair has taken place, is an important

point to be observed ; this practice being the best guarantee that a traumatic stricture will not be the result, and if it be, its risks will be materially lessened.

To illustrate the practice which has been thus briefly sketched, the following cases may be of value :

CASE 1.—*Ruptured urethra from the passage of a cart wheel over pelvis ; introduction of catheter, and recovery.*—Henry L—, æt. 16, was admitted, March 31st, 1860, under the care of Mr. Cock. A few hours before admission he was run over, the wheel of a cart passing over the lower portion of the abdomen ; the accident was followed by a flow of blood from the urethra, and retention of urine. When admitted, a catheter was introduced without much difficulty and left in ; it was removed in two days, and the patient passed his urine naturally, leaving the hospital convalescent.

Remarks.—This case is a type of a certain class of cases, and indicates the practice which is to be pursued, no complication, fortunately, followed the injury ; and no difficulty in the treatment was therefore experienced. In the following cases, however, different conditions will be displayed.

CASE 2.—*Ruptured urethra, treated by the introduction of a catheter ; secondary abscess in the perineum which was opened ; convalescence.*—P. W—, æt. 14, was admitted on July 3rd, 1854, under the care of Mr. Cock, having just previously received an injury to his perineum from a fall across an iron-rail ; the accident was followed by the flow of blood from the urethra for which he was admitted. A gum elastic catheter was immediately introduced and left in ; it was observed, however, at the time, that there was an extensive effusion of blood in the perineum. On the seventh day this blood had softened down, and had given rise to suppuration, a free incision was therefore made in the perineum, giving it free exit. The catheter was also still left in. The wound healed kindly, and the boy left cured, twenty-three days after the injury.

CASE 3.—*Ruptured urethra ; introduction of catheter ; secondary abscess in the perineum, treated by a free incision ; subsequent dilatation and recovery.*—W. E—, æt. 30, was ad-

mitted, October 2nd, 1854, under the care of Mr. Birkett, having three hours previously fallen over the back of a chair, and injured his perineum. The accident was immediately followed by a flow of blood, which continued till his admission. After some difficulty a catheter was introduced into the bladder, and left in. On the third day it was withdrawn, and all attempts at its re-introduction completely failed. The perineum was also tense and swollen from extravasated blood. An incision was therefore made into this part, giving exit to pus and blood. Fifteen days subsequently a catheter was introduced, and fastened in, all earlier attempts having failed; and in five days later a larger one was substituted. On November 9th, or the thirty-fifth day after the perineum had been incised, urine ceased to flow through the wound, and after this it rapidly healed, and the man left cured.

Remarks.—The two cases just given are good examples of a class of cases of ruptured urethra, in which the progress to recovery was not so good as in the case first quoted. The ruptured urethra in both classes was evidently partial, and the introduction of a catheter was readily allowed; but in the first case everything went on favorably towards recovery, but in the last two the effused blood was too extensive, and the injury too severe to permit of such a result taking place. Perineal abscess consequently formed, which was treated as a perineal abscess connected with urethral mischief should be, by a free incision. The catheter was, however, steadily maintained in the bladder to prevent contraction, and recovery followed.

CASE 4.—*Ruptured urethra; catheterism impossible; incision into the perineum; recovery.*—H. C—, æt. 53, was admitted on September 5th, 1860, under my care, with retention of urine following a ruptured urethra, the accident having been produced two days previously by a fall across a hard body. Catheterism had been attempted, and had failed, the perineum being apparently disorganized. A free incision was therefore made into the perineum, upon a grooved staff passed through the penis; but no entrance to the bladder, however, could be detected.

On the sixteenth day urine first flowed through the urethra, and the introduction of a catheter proved successful. From this time all went on well, and convalescence followed.

CASE 5.—*Ruptured urethra ; extravasation of urine ; catheterism impossible ; incision into perineum ; recovery.*—A boy, æt. 7, was admitted under the care of Mr. Poland, on August 5th, 1857, with extravasation of urine into the scrotum, penis, and perineum, the result of a ruptured urethra produced by a fall astride a fence. A free incision was at once made into the parts, to give relief to the extravasated urine, and the urethra was opened in the perineum. The following day a catheter was passed, and left in. Convalescence rapidly followed, and the child left the hospital well.

CASE 6.—An infant, but 18 months of age, was admitted under the care of Mr. Cock, on October 24th, 1860, with a ruptured urethra, produced by the passage of a wheel over the pelvis. Catheterism completely failing, nine hours after the accident the perineum was incised, and urethra opened. Urine subsequently made its way through the wound, and in a few days through the urethra, convalescence following.

CASE 7.—*Ruptured urethra ; extravasation of urine ; perineal incision ; recovery.*—John C—, æt. 21, admitted September 4th, 1858, with extravasation of urine of a week's duration, following a ruptured urethra produced when riding. Mr. Birkett, the surgeon of the case, at once laid open the urethra in the perineum, using a grooved staff as his guide. Six days subsequently a catheter was passed, and left in for five days, when it was changed for one of larger size. Five days later this was removed, the whole of the urine passing the right way. The perineal wound rapidly healed, and convalescence followed.

CASE 8.—*Ruptured urethra ; extravasation of urine ; catheterism and perineal incision ; recovery.*—J. B—, æt. 35, was admitted on February 18th, 1855, under the care of Mr. Cock, with extravasation of urine into the perineum and scrotum, the result of a lacerated urethra, caused by a fall when jumping across a post. After some manipulation, a catheter was introduced and left in, a free incision being at the same time made into the perineum and scrotum, which was infiltrated with extravasated urine.

On the 19th day, urine ceased to flow through the perineal wound, and convalescence followed.

Remarks.—The cases which I have just quoted are amply sufficient to illustrate the different complications which are likely to follow a laceration of the urethra; and the different details of practice which are required in each. The object of the surgeon, in his treatment of these cases, is to secure, and subsequently to maintain, the patency of the urethra; to prevent the occurrence of extravasation of urine, or to mitigate its evils. At the same time, he must bear in mind the fact that a bad form of stricture may be the secondary result of the injury, and that to meet this contingency the only sound treatment is that of dilatation, which is to be secured only by constant catheterism.

CHAPTER XLIV.

ON CALCULUS IN THE URETHRA, WITH REMARKS ON EXTRAVASATION OF URINE IN CHILDREN.

IN former chapters it has been explained how retention and extravasation of urine may be produced by the mechanical obstruction of a urethral stricture; in the present I propose to explain how the same results may be brought about by a mechanical obstruction of a very different kind, and how these symptoms are to be treated; I allude to the obstruction caused by a urethral calculus.

A calculus vesicæ, when small and when ejected from the bladder, may become lodged or impacted in any portion of the urethra, and give rise to every degree of difficulty of micturition, even to a retention of urine and extravasation. In adult life it has never fallen to my lot to witness a case of extravasation of urine as a result of an impacted calculus; but in infancy and childhood, with some rare exceptions, all the examples of extravasation of urine which have passed under my observation have been the product of such a cause. Stricture of the urethra in young life is an almost unknown disease, and, with the exception of a local injury, of congenital defects,

and an impacted calculus, there are no mechanical causes which are capable of producing a retention of urine, and consequently, an extravasation. "Extravasation of urine, therefore, when found during childhood, is almost invariably the result of an impacted calculus," and it is with the knowledge of this fact constantly in his mind, that the surgeon should always look upon and treat every example of this dangerous surgical disease. I have the notes of fourteen cases of impacted urethral calculus; three only were in adults, the remaining eleven having taken place in children; eight of these were under five years of age, the other three having been seven, nine, and eleven years respectively. "It would, therefore, appear, that it is in young life that a vesical calculus is most prone to become impacted in the urethra, and to cause symptoms of urinary obstruction."

In the three cases which took place in adult life, partial urinary obstruction alone existed, and in each the calculus was impacted behind the glans penis. Two of these were readily relieved by the removal of the stone by means of forceps; in the third case the termination of the urethra required division before the calculus could be extracted.

If we analyse the eleven cases which took place during young life, we shall find that in one case only had the calculus passed so far as the penis, and in that the stone was removed by means of forceps; in the remaining ten it had become fixed in the perineum, and in five of these the children had been admitted for extravasation of urine. "It would thus appear that in childhood it is a rare thing for a calculus to pass beyond the perineum, and that retention, with extravasation of urine, is a common result of its impaction."

The following are brief notes of the ten cases, the first four having been admitted for retention of urine.

CASE 1.—Philip W—, æt. 14 months, was admitted under the care of Mr. Cock, with retention of urine of twenty-five hours' duration. A calculus was detected behind the bulb, and was therefore excised, convalescence following.

CASE 2.—Thomas J—, æt. $3\frac{1}{4}$, was admitted under my care, for retention of urine, and, on examination, a calculus

was detected behind the bulb. Chloroform was administered and a perineal incision made upon a grooved staff, but no calculus was found, it having apparently passed backwards into the bladder. The urine, however, was drawn off, but no sounding could detect the stone. On the ninth day, however, retention of urine again appeared, and, on examination, it was found that the calculus had been again ejected into the urethra, and had passed the perineal wound to become impacted anteriorly to it. This was readily removed by an incision, and convalescence followed.

It must be added, however, that in this case if the calculus had been felt within the bladder after the first attempt at its removal by operation had been made, I should at once have increased my incision and removed it by the median operation.

CASE 3.—John F—, æt. 7, was admitted under the care of Mr. Birkett, for retention of urine from the presence of a calculus impacted in the scrotal portion of the urethra; an incision was at once made for its removal, and the urine drawn off. On the following day some extravasation of urine appearing in the scrotum, a catheter was passed and left in. On the thirteenth day all the urine flowed through the natural passage, and recovery followed.

CASE 4.—William A—, at. 9, was admitted under the care of Mr. Poland, for retention of urine of some days' duration, from the presence of calculus impacted in the perineum; this was at once excised, and convalescence ensued.

CASE 5.—H. J—, æt. 12, was admitted under the care of Mr. Cock, with retention of urine, having had symptoms of urethral calculus for six weeks. On examination the stone was found to be impacted in the urethra about the bulb; it was, accordingly, at once excised and a catheter passed, rapid recovery taking place.

We will now proceed to quote the cases of extravasation of urine as a result of impacted calculus.

CASE 6.—William W—, æt. 2, was admitted under the care of Mr. Cooper Forster, with extravasation of urine of three

days' existence, but no calculus could then be found; a free perincal incision was at once made, laying open the urethra, and, on the second day, the stone came away; convalescence speedily ensued.

CASE 7.—Alfred N—, æt. 3, was admitted under the care of the same surgeon, with extravasation of urine from the presence of an impacted calculus. A free incision was at once made in the perincum, laying open the urethra, and removing the stone; the operation being followed by a rapid recovery.

CASE 8.—Henry B—, æt. 3, was admitted under the care of Mr. Birkett, with extravasation of urine of three days' standing, evidently from an impacted calculus. A perineal incision was at once made, which was followed by a subsidence of all symptoms and gradual convalescence.

The boy had been lithotomized by Mr. Cock eighteen months previously.

CASE 9.—James W—, æt. 2, was admitted under the care of Mr. Callaway, with extravasation of urine of two days' duration, and marked symptoms of uræmia, evidently from the presence of an impacted calculus. The stone was, consequently, at once removed by a free incision into the perineum, but the child never completely rallied, and died from exhaustion and peritonitis upon the twenty-seventh day.

CASE 10 was similar to the last, and proved fatal on the fifth day.

The ten cases which have been just quoted are amply sufficient to illustrate the results of a calculus becoming impacted in the urethra, and the treatment which is to be pursued in each.

The majority of these cases come under the notice of the surgeon as instances of retention, and if there is no condition of the penis, such as phymosis, by which this symptom may be produced, there is a strong probability that it will be explained by the detection of a calculus in the urethra.

If the calculus can be removed by means of forceps, which can hardly be expected in early life, as the passage is

so small, this practice should be at once carried out, but if failure follows, the stone must be at once excised. The first five cases recorded, prove the value and simplicity of the practice, no bad result having taken place in any one instance. In the remaining five, however, the result was not so favorable; in two the extravasation of urine was so extensive as to produce peritonitis, the urinary infiltration having evidently passed backwards around the neck of the bladder, and have thus given rise to peritoneal inflammation.

In the treatment of these cases the principles to be carried out are very simple. The urethra must be opened in all, to ensure the free escape of the urine and the removal of the stone. In some cases, however, the calculus cannot be found, as it may be lost in the infiltrated tissues; but there can be little doubt that a calculus, by becoming impacted, was the cause of all the symptoms, and that, as in Cases 2 and 6, it will eventually be discovered. The practical point for recollection being that extravasation of urine in childhood is almost certainly the result of an impacted calculus, and that an early perineal incision is the only sound treatment.

CHAPTER XLV.

ON THE IRRITABLE AND INFLAMED BLADDER.

REGARDING the irritable bladder as a symptom which is almost invariably present in nearly every disease of the urinary organs, whether that disease be situated in the urethra, prostate, kidneys, or bladder itself, it becomes almost an impossibility for us to place any distinct or definite value upon its presence in any single case. It may indicate simply some slight deviation from the healthy relations which are usually maintained between the bladder and its urinal contents; or it may be a symptom of severe, if not fatal, organic disease.

It may be simply a result of some slight adhesion between the prepuce and the glans penis, or a serious symptom of cerebral

affection ; nevertheless it is a prominent symptom of most of the diseases of the urinary organs, for which the surgeon is called upon to prescribe ; and, in many instances, is the only, or at any rate the most distressing one which had induced the patient to seek advice. In a practical paper like the present, I have thought it well, therefore, to give it a separate consideration, although it must be remembered that it is only a symptom of many and varied pathological conditions.

Irritable Bladder in Children.

If the patient should be a child in which this irritability of bladder is well marked, the condition of the penis should first receive the attention of the surgeon ; if the prepuce be very long, or adherent to the glans penis ; if the secretion from Tyson's glands should have accumulated and have become indurated from want of cleanliness, there will be strong reason to believe that the irritability of bladder is the direct product of these apparently simple causes, and that on their removal the symptoms will disappear. To secure this end, all retained secretion should be taken away ; the adhesion between the glans penis and prepuce must be carefully separated ; and, if the prepuce be long, as will be usually the case, circumcision should be performed. The practitioner bearing in mind the fact that any of these simple conditions of the penis are sufficient to produce the symptom, and that a cure is only to be obtained by their removal.

If, however, no such conditions are to be observed on a careful examination, the next point into which the investigations of the surgeon are to be directed, should be the condition of the bladder.

It may be that on the passage of a sound, an instrument with a bulbous extremity being preferred, a calculus will be detected ; if so, the cause of the symptom will be clearly explained, and the practice to be followed equally laid down. It must be remarked, however, that if a calculus is the cause, a careful inquiry will detect the presence of other symptoms, such as hæmaturia, pain after micturition, and an occasional interruption to the flow of urine ; the two former symptoms may, however, be present in irritable bladder from an adherent pre-

puce, but the intermitting urinal flow is more characteristic of the presence of a stone. Should, however, a careful examination of the bladder fail to detect the presence of a calculus, it is not to be at once assumed that no such cause really exists; for, on a subsequent examination, the stone may be readily discovered; the calculus having in the first examination been probably covered by one of the folds of mucous membrane of a partially contracted bladder. Should repeated examinations fail to detect a stone, the condition of the bladder is the next point which should receive attention; it may be that to the sound its mucous lining will feel rough, and the presence of the instrument will cause more or less pain and desire to micturate; under these circumstances the urine will be probably altered in character, and on its examination after standing, a cloudy deposit of mucus, if not of pus, will be detected; the latter deposit, however, is very rare in young subjects.

Under these circumstances the general health of the child will require attention; it may be that some slight aperient or alterative may be required, or perhaps a tonic; rest, as far as it is possible to be secured, should be enforced; and an alkali of potash indicated; the object being to make the urine as unirritating as possible, and thus to allow the vesical mucous membrane to return to its normal condition.

The diet must be of the simplest nature, and meat is to be given in moderation, as in these cases it will be often found that the urine is naturally loaded with lithates, if not with lithic acid, and this tendency to the deposition of such ingredients would be increased by the free administration of animal food. Should, however, a case of irritable bladder in a child present itself to the notice of the surgeon, in which none of the conditions previously alluded to can be found to exist, and in which the penis, urethra, and bladder, appear perfectly natural, and in a healthy condition; the state of the rectum should be inquired into; for doubtless the presence of worms, and more particularly of ascarides, are quite sufficient to produce an irritable condition of the urinary organs. These are readily removed by a jalap purge, or an enema of some bitter vegetable infusion, such as quassia; although the condition of the digestive apparatus will require attention, as it is upon it that the development of worms essentially depends.

Irritable Bladder in Adult Life.

Excluding the presence of a calculus vesicæ as a cause of irritable bladder in young children, it has been already shown to be an affection of comparatively small importance if its true cause is accurately recognised; for the conditions upon which the symptom depends are readily remediable, and the irritability of bladder rapidly disappears on their removal. In adult life, however, this irritability of bladder cannot be regarded in such a favorable light; for it is too often a symptom of conditions which are by no means readily removed, and which are too often very serious in their nature.

A congenital or acquired phymosis, with a contracted orifice, or with adhesions between the prepuce and the glans penis, are conditions which are amply sufficient to produce this symptom in the adult, as well as in the child; although these causes are not so common at the later as they are at the earlier periods of life; nevertheless they are causes of the affection, and as such require notice.

As a symptom of stricture, the irritable bladder is by no means without its value; and as a rule it indicates a narrow one, and probably a contraction which has been so gradual in its progress as to escape notice until this irritability of bladder enforced more accurate observation, and had thus induced the patient to seek advice. It must be regarded as a result, therefore, of a urethral stricture, and can only be relieved or removed by the cure of its cause. It is, doubtless, produced by some chronic inflammatory action of the vesical mucous membrane, and as such requires treatment. Absolute rest, and the administration of alteratives, being probably the best; the treatment of the stricture being pursued at the same time.

As a symptom of enlarged prostate this irritability of bladder is a complication of serious import; and it is also found in old people in whom no such enlargement of the gland can be observed; in both classes of cases, however, it is the product of the same cause; the symptom being evidently the result of a want of power on the part of the bladder to empty its contents: in one case from a mechanical obstruction, in the other, simply from a loss of power in the parts perfectly to contract.

The residual urine subsequently partially decomposes and becomes ammoniacal; thus acting as an irritant to the mucous membrane of the bladder, and giving rise to the irritability.

The treatment of these cases is not, therefore, a task of difficulty; the removal of the urine, and the prevention of its subsequent retention by the cautious employment of a catheter is most essential; and the frequent washing out of the bladder with warm water, or with water medicated by some solution of morphia, opium, or some stimulant, according to circumstances, is an equally essential and valuable practice.

The recognition of the cause of the symptom is the most essential point, however, for the surgeon to bear in mind; the practice to be followed readily suggesting itself to his mind when the case is understood. As a sign of gravel it is of importance, and a careful examination of the urine will alone determine the true cause. As a symptom of calculus in the bladder it is constant and valuable, although in some cases of stone it is extraordinary how little irritation the presence of a calculus will produce.

As a sign also of organic disease of the bladder, this irritability must not be passed over; but the obscurity of this class of cases is very great, and the correctness of diagnosis must rest upon the combination of many symptoms, no one being of greater value than another.

And lastly, this irritability may be the product of a renal affection; and it will consequently be found in cases in which the urethra and bladder are evidently perfectly sound. The absence of all symptoms of disease in these parts, aided by the presence of other renal symptoms, and by what is of great importance, the careful chemical and microscopical examination of the urine, being alone sufficient to enable the surgeon to arrive at anything like a correct diagnosis. But the practical point for remembrance is the fact that renal disease may give rise to all the symptoms of a vesical affection; and that when these are present, and a careful examination fails to explain them by the presence of a vesical disease, the probability that renal disease is the cause may be fairly assumed.

Irritability of bladder may also be produced by some cerebral or spinal disease, but the fact can only be alluded to in these pages.

Irritable Bladder as a symptom of Cystitis.

As a symptom of cystitis, this affection is most distressing ; as a result of a gonorrhœal inflammation it is very common, and requires in its treatment great care, as it may become chronic in its nature, and lead to local changes which are apt to become obstinate as well as painful. It is evidently produced by the extension of inflammation from the urethra to the vesical mucous membrane, and appears in certain cases, whether the patient has employed injection or not ; the cachectic patient is doubtless more frequently its subject than the robust and healthy, but it appears in all classes. In all cases absolute rest in the horizontal position is most essential, and as long as this position is maintained, relief to all the symptoms is very marked ; but the moment the erect position is assumed, the irritability of bladder and pain rapidly reappears. The administration of alkalies to render the urine bland and unirritating are strongly indicated ; the tartrate of potash in half-drachm doses, freely diluted being probably the best, combined or not, according to the amount of pain experienced by the patient, with some sedative, such as hyoscyamus or opium.

If the irritability is very severe and constant, even to cause an hæmaturia, an opium suppository gives great relief, or the injection of a small starch and opium enema. Occasionally in acute cases, leeching the perineum may be required, and a warm bath also gives great comfort. In chronic cases the same principles of treatment are to be applied ; rest in the horizontal position, and the use of alkalies, being the chief means. The infusions of pareira and buchu in some cases give relief, but they do not appear to be at all certain in their action, although occasionally they are of great value.

In the cystitis which is sometimes associated with a gouty diathesis, the administration of colchicum acts most beneficially ; a few doses of the wine being often followed by immediate and permanent relief. I have seen cases in which the administration of this drug acted as a charm, every symptom rapidly disappearing under its use. I possess the records of 136 cases of irritable bladder, the result of the many causes which have been just enumerated. The principles and practice which

have been indicated, were carried out in all with varied but satisfactory success, but I have not deemed it necessary to quote examples. In forty of these cases the patients had been admitted for calculus vesicæ, but repeated and careful examinations failed to discover the stone; the symptoms in all having been caused by other less serious and more readily remediable conditions. In ten of these cases renal disease complicated the vesical, and death followed. Twelve of these cases occurred in females, and in several of these hysteria was a prominent and evident cause.

CHAPTER XLVI.

ON INCONTINENCE OF URINE.

IF we exclude from our consideration all those cases of so-called incontinence of urine, the result of an over-distension of the bladder from retention; whether produced by stricture, enlarged prostate, or any other cause; and confine the term simply to that condition of bladder which allows the urine to pass out as rapidly as it passes into its cavity, we shall find that it arises from many and apparently very different conditions.

The worst is, unquestionably, that which is produced by an inflammation of the bladder, and is due to an extreme degree of irritability; in some cases being the result of the presence of a calculus, in others of inflammation from other causes; the bladder in such instances appearing to be so incapable of dilatation as almost to cause it to be regarded as a cavity, and to become part only of the urinal canal.

The incontinence is, therefore, only a symptom of more serious disease, and requires no special treatment.

The class of cases, however, to which the term incontinence of urine appears more correctly to apply are of a very distinct nature; in none of these is there any symptom of local organic disease, but the incontinence appears to be produced simply as a result of want of nervous and muscular power in the vesical walls.

It is found most frequently in young children, or in hysterical girls, but it is occasionally seen in adults, male or female, of a delicate and cachectic nature. It is the only affection from which they suffer, and the incontinence is apparently their only disease.

In some severe cases the incontinence is constant, urine flowing through the urethra as secreted and poured into the bladder; but in others it is not so; during the day the patient can in many cases prevent its flow, but during the night it passes involuntarily; it may be that it is not then quite constant, but appears only when the bladder has become distended beyond a certain point.

To all appearance the bladder and urinary passages are quite healthy, and the spinal system appears free from disease; the incontinence being evidently due to some functional derangement, and does not depend upon any visible organic changes.

In the majority of these cases which have fallen under my observation, I have found the urine to be very limpid and abundant, and in some instances phosphatic; and I have been led into the belief that this incontinence is very frequently the result of great irritability of bladder, induced by the contact of its mucous lining with urine, which, if not alkaline, is not at any rate sufficiently acid for the normal relations between the two to be maintained.

The treatment which is generally found of value in this affection tends to support this view, as the tincture of the muriate of iron is unquestionably the most valuable drug, and the urine under its use rapidly changes its limpid nature.

In cases of hysteria, doubtless, the incontinence depends upon the want of mental effort to restrain the flow, aided more or less by the causes which have been previously specified.

The treatment which is to be followed in these cases has been already hinted at. Tonics are evidently indicated; the acid preparation of iron being the best, given in twenty minim or half-drachm doses, three times a day; the drug acting, in certain cases, as a charm.

CASE.—A boy, æt. 15, applied to me some months back with incontinence of urine of twelve years' duration; it was constant during the night, but during the day he had some

power of retention. His urine was limpid, and somewhat abundant.

The tincture of the muriate of iron was given in fifteen-drop doses, three times a day, and in two weeks he was quite well. The use of the drug was, however, persevered in, and six months after I saw him and he had experienced no return.

The patient should be lightly covered at night, and should sleep upon a hard bed; any means being employed which will prevent the patient lying upon his back—some hard object, such as a stone tied in a handkerchief over the sacrum, being a ready and useful means.

Belladonna, as a remedy in this disease, has given me disappointment; it has been highly extolled, but in my hands has not proved of much value. The acid preparation of iron being the best. *Nux vomica*, and other vegetable tonics, are in some cases of great value, but they do not appear to be of equal value with the mineral tonics.

All hygienic mental and corporeal treatment must be at the same time carried out, the disease generally disappearing with improved powers.

I have the record of sixteen examples of these affections, which were admitted into the hospital; the majority of these cases are, however, treated amongst the out-patients, and with success.

I have also the notes of six cases of incontinence after the operation of lithotomy, and in them some slight relief was afforded by a tonic treatment, but as a rule these cases are obstinate in their nature, and too often defy all our efforts for their relief.

CHAPTER XLVII.

ON HÆMATURIA.

HÆMATURIA claims our attention as a symptom of many diseases of the urinary organs, although little can be said concerning it, as a symptom having any definite value. The term is applied to all cases of hæmorrhage from the urethra, whether

coming from the passage itself, prostate, bladder, or kidneys, and may be connected with very simple or very serious local changes.

Urethral hæmorrhage.—Bleeding from the urethra, takes place occasionally as a result of a severe gonorrhœa, or as a sequel of intense sexual excitement, or a chordee; but, independently of these causes, or as the consequence of an injury, hæmorrhage from the urethra is of rare occurrence. Nevertheless, I possess the records of two cases of hæmorrhage from the urethra, in both of which the bleeding appeared independently of any of the causes just enumerated, and for which no reasons could be assigned. The symptom existed alone, but of what pathological condition it was the result it is impossible to say. I propose, therefore, to quote the cases as they are reported in my note-book, simply as cases of interest.

CASE.—William A—, æt. 17, was admitted on September 15th, 1857, under the care of Mr. Birkett. He was a single man, and a baker by trade. He had always had good health, and had no symptoms of any disease. When at work at four o'clock a.m. of the day of his admission, he felt something running down his leg, and on examination he found that blood was flowing freely from his urethra. The flow was unaccompanied by pain, and was not preceded by any symptoms, and he positively assured me that he had not been previously sexually excited. Ten hours after its appearance, as the hæmorrhage continued, he came to Guy's, when the introduction of a large catheter at once checked its flow. No obstruction was observed, and no symptom of urethral or vesical disease detected. The urine was quite clear, proving that the blood came from the urethra. He was much blanched from loss of blood. Sulphate of lead was given in gr. v doses, and in two weeks he left, not having had any return of the symptoms.

CASE.—E. G—, a single man, æt. 32, was admitted on November 14th, 1858, under the care of Mr. Cock. When walking, on the day of his admission, and when perfectly calm and unexcited, he felt something pass from his urethra. On examination he observed that it was blood, and, feeling alarmed, he came to Guy's. When admitted, the hæmorrhage had

ceased, although abundant evidence existed that a considerable quantity must have been lost, his clothes being quite saturated. A catheter was passed, but nothing abnormal was observed, and after a few days' rest he left cured.

Remarks.—As a result of a rupture of the urethra from an external injury, as well as from violent catheterism, hæmorrhage is too common. In such cases, however, the bleeding is neither obstinate, nor generally severe, but the treatment of this complication has been already discussed.

Hæmorrhage from the Prostate.

As a symptom of disease of the prostate gland, hæmaturia is not unfrequent. It will appear sometimes on the passage of a catheter for difficult micturition depending upon an enlargement of that organ, even when no force has been employed; the introduction of a catheter being amply sufficient to cause a rupture of one of the large net-work of veins which surround the neck of the bladder in old people. In some cases the hæmorrhage is severe, and when it passes backward into the bladder is a source of some alarm and some danger. It is also a common associate of cancerous disease of that gland.

Vesical Hæmorrhage.

The commonest vesical hæmorrhage is, without doubt, that which is produced by the violent straining of an irritable or inflamed bladder, as shown by the last acts of micturition being attended by the passage of more or less blood. As a symptom of this condition, it is not a serious one, the hæmorrhage being generally very slight, and perhaps acting rather favorably than the reverse. As a symptom of gravel or calculus it is very common, and is the immediate result of the same cause as the last, namely, the violent straining. In some instances, there is, doubtless, ulceration of the bladder, in which case the blood flows more copiously and more readily. In both cases, however, the hæmorrhage is merely a symptom of another and more serious affection.

Hæmorrhage from the bladder appears also as a symptom of

cancer of that organ; and also as a result of polypus, more particularly of that villous growth which is occasionally seen in those parts, and of a peculiar vascular growth, which may grow from any part of the urinary passages.

In the majority of cases of vesical hæmorrhage, the blood comes mixed but not incorporated with the urine, and generally follows the ordinary flow. But this is not always the case, and although, as a means of diagnosis, this fact is of value, considerable care and much discrimination is required in forming a correct diagnosis of the condition upon which it depends.

Renal Hæmorrhage.

As an immediate result of injury to the kidney, whether of contusion or of rupture, hæmorrhage is a constant sign. In rare cases, however, it does not appear till some hours have elapsed after the accident, and when the blood appears it will be intimately mixed with the urine. I have the records of two cases in which twelve and twenty hours respectively elapsed between the receipt of the injury and the appearance of the blood; the urine in the interval having been quite clear. In these cases it would appear to be produced as a secondary hæmorrhage, the original injury not having been severe enough to rupture the vessels.

In some instances, the hæmorrhage may continue for several days. In the treatment of these cases, perfect rest is most essential, but beyond that, the natural powers are generally sufficient to effect a cure, the hæmorrhage ceasing when the injury upon which it depended has been repaired. If the bleeding should, however, be very obstinate, an astringent, such as gallic acid in gr. v doses is often serviceable.

Hæmaturia is also a common symptom of calculus in the kidney, as well as of cancerous disease; but the hæmorrhage is only one of many other symptoms, and although it is enough to indicate the seat of mischief, it is of small value as indicating the condition upon which it depends; such a diagnosis requiring for its determination the aid of much observation, close thought, and microscopical investigation of the urinary secretions and contents.

On Inflammation and Abscess of the Prostate.

The pathological investigations of Mr. Thompson into the diseases of the prostate gland have been the means of correcting many of the opinions which surgeons held concerning the affections of this organ. He has proved to us that the enlargement of the gland is not to be considered a senile change of general occurrence, although it appears in about 34 per cent. of men above sixty years of age, but it does not give rise to any symptoms in half the cases.

Enlargements from the development of simple adenoid tumours are also not infrequent; but cancerous tumours are very rare.

In former chapters I have already considered the results of an enlarged prostate and their treatment; difficult micturition and irritable bladder being the chief symptoms. In the present chapter I propose to consider briefly the effects of inflammation of the gland, and more particularly when this inflammation terminates in the formation of an abscess.

In middle life it is tolerably certain that enlargement of the prostate gland is generally due to a chronic inflammation; the chief symptoms by which this condition will be manifested are vesical; irritability of bladder, and pain *during* and after micturition being commonly present. The patient will generally also complain of some pain in defecation and a feeling of fulness in the part, with a sensation of obstruction to the lower bowel. A digital examination per rectum will detect a tenderness of the gland, if not an enlargement, and the attempt to pass a catheter will cause extreme pain.

By these symptoms an inflammation of the prostate may be fairly diagnosed, and by their severity will the acute or chronic form be recognised.

If the enlargement is very great and suppuration follows, other symptoms will make their appearance.

Retention of urine is one of the most marked, the retention being caused simply by the mechanical obstruction produced by the enlarged and distended gland. If an abscess exists, the constitutional disturbance will often be very severe, and local pain most intense. The abscess, if left alone, may dis-

charge itself, but the process is a very tedious one, this fact being explained, the body of the gland being closely surrounded by a dense fascia. As a rule it will discharge itself into the urethra, but occasionally it will open into the rectum. The abscess very rarely making its appearance forwards in the perineum.

The following cases will, perhaps, best illustrate the subject, and the treatment which should be pursued :

CASE.—*Extensive abscess in the prostate discharging itself into the urethra.*—Thomas C—, æt. 43, a coachbuilder, was admitted under my care for retention of urine; difficulty in micturition having been coming on for three weeks, accompanied with pain during micturition and defecation and some constitutional disturbance. On examining the perineum some tenderness and hardness were present, and pressure on the part caused severe pain. In passing the finger into the rectum, a large, firm, and elastic tumour was readily detected in the site of the prostate gland. It appeared to fill the whole pelvis, and to extend in all directions as far as the finger could reach. During the examination, however, something was felt to give way, and was accompanied with a free flow of pus from the urethra, the abscess having evidently ruptured into the urethra. The man was therefore left alone, the abscess rapidly emptied itself and subsequently contracted, the patient leaving the hospital well in three weeks.

CASE.—*Abscess of prostate, discharging into the urethra; recovery.*—J. H—, æt. 22, was admitted, under the care of Mr. Cock, with a prostatic abscess which had just prior to admission burst into the urethra, discharging pus and blood. It had been coming on for three weeks, and had been accompanied by much pain both during micturition and defecation. The symptoms, however, rapidly subsided, and recovery ensued.

CASE.—*Abscess in the prostate and traumatic stricture; abscess opened; recovery.*—J. H—, æt. 27, was admitted under the care of Mr. Cock, with a deep abscess in the perineum, evidently communicating with the prostate; this was associated with a stricture, the result of an injury fifteen years

previously, and for which the perineum had been incised after the accident. A deep incision was at once made in the perineum, giving exit to several ounces of fetid pus, and convalescence ensued. This man was re-admitted five years subsequently, with the same symptoms, and after being treated in the same way rapidly recovered.

CASE.—Stricture and prostatic abscess; perineal section recovery.—W. C—, æt. 30, was admitted, under my care, with stricture of thirteen years' duration, and a prostatic abscess; the enlargement of the gland filling up the lower portion of the pelvis, and causing severe pain. On attempting to pass a catheter into the bladder the abscess was opened, but as the stricture was narrow it was thought advisable to make a perineal incision into the abscess, and to divide it. A small grooved staff was consequently passed, and a free incision made through the stricture and into the abscess, giving exit to a quantity of pus. All the symptoms at once subsided, and recovery rapidly followed.

Remarks.—The practical point in these cases of suppuration of the prostate gland remains to be drawn, and is fairly illustrated by the cases which have been quoted.

If the abscess has discharged itself and a free outlet evidently exists, it is as well to leave nature to complete the process of cure, and to let well alone; care being taken that the patient is kept completely at rest. If, however, the abscess has not discharged, and it is causing much pain or difficulty in micturition or defecation, and more particularly if it appears to project towards the perineum, a free opening at the projecting part is the best practice, the operation giving rapid and permanent relief.

If a urethral stricture co-exists, a perineal incision upon a grooved staff is the correct practice; the operation relieving the prostatic mischief with the urethral, and thus saving time.

The practice of opening the prostatic abscess into the rectum, as advocated by some surgeons, does not appear to me to offer any advantages; whilst, on the other hand, there appear objections to the practice which do not apply to the one which I have already indicated.

The chances of establishing a urinary fistula are the most forcible

ble, as a urethral communication almost always exists sooner or later, and with a double opening a fistula is likely to take place.

It must not be thought, however, that suppuration of the prostate always follows upon an inflammation of the gland; if the disease is treated early it may be prevented, but in hospital practice patients frequently fail to apply for advice till suppuration has taken place, when preventive treatment is inapplicable.

In the following case suppuration was prevented, and the treatment of the affection is fairly shown.

CASE.—Inflammation of the prostate after gonorrhœa; recovery.—James D—, æt. 31, was admitted under the care of Mr. Cock, having had the clap six months previously, and for which he had taken abundance of copaiba and had used injections. For the two months prior to his admission he had experienced a constant aching pain in the perineum, and for a week he had had occasional rigors; for three weeks he had felt, also, considerable pain and difficulty in micturition and in defecation. On examination it was very evident that the prostate was enormously enlarged; both the rectal and perineal examination causing severe pain.

He was kept in bed, a simple purge was given, and saline effervescing medicine administered, and, under this treatment, all the symptoms gradually disappeared. In a week he could pass his urine and motions without difficulty, and in three he left cured.

Remarks.—In this case, although the symptoms were very marked they were not severe. If the local pain had been very intense the application of leeches might have been of use. Hot baths and opium, in like cases, also, may at times be called into requisition. If the symptoms are slow in passing away, the application of counter-irritation, by means of a small blister to the perineum, appears to give relief, and the iodide of potassium internally is of some use. If any gouty disposition exists, the administration of colchicum is most useful; whilst the horizontal position must be maintained till the recovery is complete. The bowels should be kept loose, to prevent straining, either by means of enemata or the administration of a laxative, such as olive oil. By this treatment pain is relieved, and a gradual recovery ensured.

CHAPTER XLVIII.

ON STONE IN THE BLADDER.

THE paucity of our knowledge relating to the causes which tend to the formation of a calculus is a subject of deep regret; for I imagine the frequency of its occurrence will not diminish until we are enabled, by an improved physiology, to appreciate the conditions of system under which it occurs, in order that we may discover a treatment by which its production may be prevented. As surgeons, however, we have to deal with a calculus already existing, and to direct our attention to the selection of the best and safest means by which it can be removed. Two thirds of the cases of stone in the bladder, as they come under our notice in hospital practice, are in children, and half of these are under five years of age. It is also a subject worthy of remark, that these young ones are generally of a healthy and ruddy aspect, and form a contrast to the children admitted for other diseases; the patients with stone being unquestionably the best nourished and healthiest subjects admitted into a metropolitan hospital. The formation of a calculus does not, therefore, appear to depend upon a low condition of the vital powers, but, on the contrary, is apparently a condition of body not incompatible with good health.

In adult life, however, the same remarks are hardly applicable; in many cases the subjects of a stone are certainly otherwise sound, and have the general appearance of healthy men; but in older subjects, and in some middle-aged men, the presence of a calculus is frequently associated with cachectic appearances and with other serious and organic disease. In many cases this disease being evidently the result of the long presence of the calculus, but in some undoubtedly the stone is the result of the disease.

Diagnosis and Symptoms.

It would be no less satisfactory to the surgeon than to the patient if the earliest symptoms of calculous disease were at once

recognised; but it is too truly the result of experience when it is affirmed that in the majority of cases of stone, symptoms have existed for many months, if not years, before it has been deemed necessary to seek advice. The cause of this delay is not, in all cases, indifference or carelessness; but it is, in a great measure, due to the uncertainty of the symptoms and the comparatively little inconvenience they cause the patient. It is a rare thing for parents to seek professional advice for children suffering with stone, until some hæmaturia has been observed, or the pain which the child experiences after micturition, which is generally frequent, has caused evidence of great distress. Upon inquiry the surgeon will then generally learn that for many months the child had been observed to play with the penis after micturition; that the stream had occasionally been interrupted in its flow; and that a frequent call to make water had long existed.

With these symptoms the presence of a calculus may be fairly suspected; but it can only be on its absolute detection by a sound that its existence can be affirmed. For nearly all the symptoms which have been enumerated can be produced by other and less important conditions; an elongated and adherent prepuce having been already shown to be the chief.

A retention of urine is also another symptom for which the surgeon may be consulted by a patient with stone, and if it be in a child, the probability that a calculus is the cause is very strong.

The opposite condition of incontinence of urine is, also, no less characteristic of the presence of a stone in early life; and, when present, it frequently indicates the presence of a calculus which has been forming for a lengthened period, and is often connected with organic renal as well as vesical changes.

In adult life, fortunately, the same apathy and indifference to early symptoms is not so general; a man suffering constantly from a frequent desire to pass water, will generally at once seek advice, and if this is the only symptom of which complaint is made, and it has been of some duration, the introduction of a sound is the readiest and best means of satisfying the mind whether a stone is the cause or not. In some cases this is the only symptom, and it should not, therefore, be disregarded and treated lightly.

In other cases, however, the symptoms which have been already mentioned will be present in different degrees of severity or in different combinations; the symptoms indicating the presence of a calculus varying from the slightest irritation of the bladder to the severest agony. The importance, however, of an early detection of a calculus is so great, that it is better in every case of irritable bladder which is not palpably the product of another affection, to suspect the existence of a stone, and to examine the patient with a sound accordingly; than to run the slightest risk of overlooking its presence, and thus of increasing the dangers (which are always great) of exciting or keeping up organic disease in the bladder, and more particularly in the kidney; for I shall show, in a subsequent page, that the simple presence of a calculus is only dangerous to life from the organic changes which it is liable to excite; and that the operation of lithotomy is not commonly fatal if no such organic changes have taken place.

The early detection of the presence of a stone becomes necessarily a point of the highest importance; the duration of life and the success of any operative measures mainly depending upon the absence or presence of renal mischief; and the excitation of this is chiefly determined by the period of the presence of the calculus.

Treatment.—There is but one principle of action to be followed in our treatment of stone in the bladder, and that is, unquestionably, for its removal; I do not mean, by this statement, that in every case of calculous disease the stone is to be cut out or otherwise removed, as there may be certain exceptional conditions of the patient, which fairly forbid the adoption of such a practice. But in the largest proportion of cases of calculus, the object of the surgeon is to remove the foreign body, and thus the source of serious local and general irritation.

In cases under puberty the practice which appears to be the most successful is the removal of the calculus by the operation of lateral lithotomy. The records of operative surgery can give no more satisfactory result than that of lithotomy in young children; my own statistics from Guy's Hospital demonstrating that only eight cases proved fatal in 160 operations performed under fifteen years of age; one instance only in every twenty dying

after the operation, and the statistics of other observers go to prove the same fact.

I have shown, also, in another place,¹ that even in these fatal cases the result is in almost every instance due to organic renal disease, and not really to the dangers of the operation. My belief is that if the operation of lithotomy is skilfully performed, and no renal disease exists, that a recovery may with considerable confidence be predicted; and that in subjects free from organic changes in their vital viscera, a favorable prognosis may be given with some certainty; this calculation is made independently of the special risks which always attend every operation, particularly of lithotomy.

If this opinion be true, or rather if the grounds upon which it is based are to be regarded as facts, the form of operation by which the stone is to be removed becomes a minor matter; whether it be the lateral operation or the median, and the choice of the form of operation may be well left to the fancy of the operator. If both are performed with equal skill, a favorable result may be fairly anticipated if the viscera are sound, but if the kidneys are diseased, no operation, however skilful may be the surgeon who executed it, is likely to turn out well.

The lateral operation appears to me, however, to be the best, as I always regard a clean wound better than a lacerated one; and better even than the free dilatation of the neck of the bladder, which must take place on the removal of a large stone from a child's bladder by the median method.

The advocates of the median operation insist that it is the simplest and most readily performed; but neither in theory or practice can I admit that it possesses sufficient advantages over the lateral, as to allow it to take its place, and to be selected in preference. Small calculi doubtless can be readily removed by this operation, with but little injury to the soft tissues; but with larger calculi there is more difficulty, and consequently more danger. By the lateral operation all calculi, large and small, are removed with equal facility, and with little, if any, increase to the danger.

In advocating the lateral operation it must not be assumed however, that I condemn the median; both are good, but I am not yet convinced that the latter possesses sufficient ad-

¹ 'Medico-Chirurgical Transactions,' vol. xlv.

vantages over the former, that the lateral should be laid aside, and the median followed on all occasions.

As far as my own observation goes, the median is attended by at least as much hæmorrhage and as much difficulty as the lateral; and, as its advocates only base its general employment upon the facility with which it is performed and the immunity from bleeding with which it is accompanied, such evidence is not much in its favour.

It is not a question whether a stone can be removed by the median operation and recovery ensue, or whether it can be performed without much difficulty; but whether there are sufficient grounds from principle and practice to prove that it possesses such advantages over the lateral plan as to supersede it. As far as argument, advocacy, and practice, has proved to me, the case is not yet made out in its favour, and till then I must advocate the practice of the lateral lithotomy.

Respecting lithotritry in children, I have nothing to add to our stock of knowledge, having neither practised nor witnessed the operation in such cases. Theoretically I can see no advantages from its adoption, but many disadvantages; and as the operation of lithotomy has been proved to be most successful; lithotritry is not a practice which I should follow.

The treatment of Stone in the Bladder in Adults.

There are no questions of modern surgery which more urgently require a satisfactory answer than those which surgeons are daily putting to one another when discussing the treatment which is to be pursued in a cachectic patient the subject of stone. Does the operation of lithotritry cause more or less local and constitutional distress than that of lithotomy? Is the condition of the viscera, and more particularly of the kidneys, such as to allow of the adoption of either practice? and will life be longer or more bearable by simply employing our surgical knowledge to relieve pain, than by removing the disease from which the pain proceeds? Other general questions upon the same subject equally press for a solution.

Is lithotritry or lithotomy to be preferred in a man the subject of a calculus, free from organic and more particularly of

renal disease? What operation is to be selected in a patient apparently the subject of such affection?

If we refer to the records of absolute experience for assistance in the solution of these queries, we find that patients afflicted with stone, when dying after either the operation of lithotomy or lithotrity, are invariably the subjects of renal disease of a chronic and disorganizing character; and that the operation itself had but very little influence in producing the fatal result; as a corollary, therefore, we conclude that in all such cases it was of small importance which operation had been performed, and that lithotomy or lithotrity would have both terminated alike.

If there is no evidence to show that the kidneys are sound in patients, the subjects of stone, who survive either operation; there is none to prove that they are diseased; and the proof of the success of the operation is a strong argument in favour of the former condition; the choice of either operation becomes, therefore, a question of expediency, and not therefore one of real life or death.

In *sound* subjects, few surgeons for a moment hesitate in recommending the operation of crushing a calculus in preference to cutting; and when the stone is of moderate dimensions, and not of a mulberry nature, few cases are more satisfactory. If, however, from any peculiarity of the patient, the irritation caused by the operation appears too much for his powers the alternative of lithotomy is still open with a fair prospect of success.

I possess the records of seventeen cases of lithotrity, and in only one of these did a fatal result take place, and that was in an old man, seventy-four, who had evidently renal disease.

In two other examples, lithotomy was subsequently performed, and one of these also died; total disorganization of the kidneys being detected on post-mortem examination.

In cachectic patients, and in others probably the subjects of renal affection, is the operation of lithotrity ever to be employed, or rather, is it to be recommended? is there less danger of hastening on a fatal result by the process of crushing the calculus, than by the operation of lithotomy?

Experience has yet to prove which practice is to be preferred—in neither case is a cure of the patient to be expected—

relief is all that can be hoped for, and is that more certainly given by one operation in preference to the other?

Sir B. Brodie, in his valuable communication on lithotrity, published in vol. xxxviii of the 'Transactions of the Medical and Chirurgical Society,' expresses an opinion, that in certain cases of calculus, associated with an inflamed bladder and enlarged prostate, lithotrity may be advantageously employed, when lithotomy could not be thought of; and he supports the opinion by assuring us that he has had two or three such cases in his own practice, in which he was enabled, not ultimately to preserve, but to lengthen, the patient's life by such means. I would not, for one moment, venture to dispute the accuracy of this opinion, coming from so great a man, but the rapid and complete relief which I have witnessed, in at least an equal number of similar cases by the operation of lithotomy, would have induced me to believe that the apparently most severe operation was at least as successful, and hardly more dangerous than that of lithotrity.

If the stone is small, the lithotrite would certainly appear to be the best instrument for its removal; but if many operations would be called for before the calculus could be removed, the operation of lithotomy recommends itself for our adoption.

Cause of death.

In a communication which I lately made to the 'Medical and Chirurgical Society' (vol. xlv), I showed that, in the post-mortem examination of nineteen patients who died after lithotomy, in seventeen extensive renal disease was found, and that death had evidently been the result of such a condition, and was but slightly due to the operation. In the remaining two cases an accidental complication was the cause of death.

This renal disease was found in the old and in the young, and it was proved that the surest guide to the diagnosis of its existence was the duration of the symptoms. In the fatal cases which had taken place in children, the symptoms had existed either as long as could be remembered, or for many years; and in the older patients, the evidence that calculus had been present for a lengthened period, was equally positive. Under

these circumstances, the grand necessity of an early detection of the presence of a calculus becomes a point of greater importance than the selection of the means for its removal; for if the calculus has been a recent formation, there is strong reason to believe that the kidneys are sound, and that either operation of lithotomy or lithotrity will prove successful; but if, on the other hand, the symptoms have existed for many years—although direct evidence may be wanting of renal disease—there would be strong suspicion of its presence; and if the calculus is removed by either operation, a prognosis should be given commensurate with the fear entertained by the surgeon that a fatal result may be expected.

After reviewing the evidence respecting renal disease as a cause of death after the operation for stone, the presence of pelvic cellulitis and peritonitis as complications apparently sink in their importance; for it becomes a question whether such inflammation would follow the skilful operation of lithotomy, if renal mischief did not previously exist; for practitioners are all well aware of the intimate connection which exists between renal disease and scrous inflammation, most patients the subject of “Bright’s” disease dying from some such complication. Under these circumstances it is certainly open to a doubt, whether patients subjected to lithotomy would be liable to peritonitis and pelvic cellulitis, had they not been rendered prone to this attack by some affection of the kidney. If this opinion be correct, it may fairly be asked what becomes of the fears by which surgeons have been haunted for so many years of exciting pelvic cellulitis by the division of the neck of the bladder to too great an extent, and of thus allowing the urine to be extravasated upwards into the cellular tissue, and of exciting inflammation?

In all cases of lateral lithotomy in children, the neck of the bladder must certainly be incised. They possess no prostate, and the introduction of the knife into the bladder invariably divides its neck. Yet they are not the frequent subjects of pelvic inflammation after the operation; and when they are, and this complication proves fatal, extensive renal disease is, at any rate, its associate if not its cause.

I must confess to have been always somewhat sceptical as to the grounds of that fear which laid to the doors of a free incision

into the neck of the bladder the occurrence of all pelvic and peritoneal mischief, believing that in children the incision was always free, and knowing that it rarely produced harm; it was difficult, therefore, to believe that in adults a wound, even equally extensive, was likely to be followed by a different result, unless performed under different conditions. After my analysis of the fatal cases of lithotomy, which proved to me that renal disease was the chief cause of death, and that it was always present, when pelvic and peritoneal mischief co-existed; when proof could be obtained, the groundlessness of these fears became more apparent, and although, in the performance of the operation of lithotomy in adults, a larger incision than is absolutely necessary cannot be recommended, the difference of a line or so, more or less, does not appear to be a point of such importance as some surgeons would lead us to believe; and that when a fatal result takes place it is not always due to the extent of the incision but to the co-existence of a renal disease, associated or not with peritoneal or pelvic complication.

This inquiry into the causes of death after lithotomy is something more than an investigation of scientific interest, for it has a practical bearing of some importance, and enables us to divide the subject of stone into two large classes.

The first contains all children and adults, who, with the exception of the presence of a calculus, are apparently free from all other disease.

And the second class contains all children and adults who are evidently cachectic, and if not palpably, are probably the subjects of some renal or organic mischief.

In the first class of cases, either operation of lithotomy or lithotrity, is likely to succeed, if performed with average skill. In the second neither operation will, in all probability, be followed by success. The one or the other may be justifiable for special reasons, either to relieve pain or to remove a source of constant irritation; but the operation will be undertaken simply for these reasons, and not with the idea of giving permanent relief, or of a cure.

In the first class either the lateral operation of lithotomy or the median may be selected, according to the fancy of the operator: both, if skilfully performed, will in all probability turn out well. In the second class, every form of operation will almost

to a certainty fail, if undertaken with the idea of being followed by a recovery; but if carried out with the hope and intention only of affording relief, such an end may be secured. There is also a third class of cases, in which no operation of any kind should be undertaken:—cases of calculus in which there is positive evidence of renal disease, but in which the stone does not produce much irritation, and in which, therefore, life is still bearable; in these middle cases as it were, the best policy appears simply to relieve symptoms, and not to think of removing the stone which does not, by its presence, produce much suffering.

In the cases which are better and worse than these an operation may be required; in the former to cure, in the latter to relieve. But in both the principles of treatment are sound, and the practice, therefore, whichever way it may turn out, justifiable.

It is wonderful, by care and good advice, how long patients the subjects of stone and organic disease, will at times live, and how little irritation a calculus will cause; and, although the knowledge of this fact should not induce surgeons to leave a patient alone who has a stone, it is enough to enable them to give hope and encouragement to him whose life would, in all probability, be endangered by any surgical attempt at its removal. Palliative treatment becomes, then, a source of great comfort, as well as a means of prolonging life.

By way of summary the following conclusions may therefore be drawn, concerning the treatment of stone in the bladder.

1. That in all cases of stone in the bladder, if the kidneys are sound, the operations of lithotomy or lithotrity are likely to prove successful.

2. That if the kidneys are diseased, however skilfully may either operation be executed, a fatal result will probably ensue.

3. That renal disease, if not capable of detection by the examination of the urine, can tolerably accurately be diagnosed by the history of the duration of the symptoms; the longer their existence the greater the probability of its presence, and *vice versa*.

4. That in children the operation of lithotomy is almost uniformly successful, about one case in twenty proving fatal,

renal disease being very rare ; and that it is to be preferred to the operation of lithotrity.

5. That in adults free from organic disease, lithotrity is a most valuable operation, and is to be preferred to lithotomy, unless, from the size and nature of the calculus, or from any peculiarity in the patient, there are strong reasons for its rejection.

6. That lithotomy in adults, between puberty and forty years of age, is fatal in one case out of seven ; and after that age in one case out of one and three quarters ; renal disease being more frequent at these periods of life, and proving the general cause of death after the operation.

7. That in patients probably and palpably the subjects of vesical, renal, or other organic disease, it is a question for future experience to decide which is the best operation to be performed for the relief of their suffering ; that lithotomy recommends itself for our adoption as being the best measure for the relief of the patient in the majority of cases ; although evidence apparently tends to show that, if the calculus be small, it may be successfully removed by means of the lithotrite.

8. That there is an intermediate class of cases between the absolutely sound and the probably or positively diseased, in which no operation is really needed ; including those in which there is evidence of organic disease, but in which the calculus causes little pain or constitutional disturbance ; and in which, therefore, it is the soundest practice to apply our skill simply to give relief.

I append a table containing an analysis of 230 cases of lithotomy, which formed the basis of a paper in the '*Medico-Chirurgical Transactions*,' vol. xlv, but which I have deemed of sufficient interest to introduce in these pages. For its analysis I must refer my readers to the original source, although many of the results have been embodied in these pages.

TABLE containing an Analysis of 230 Cases of Lithotomy, showing the frequency of its occurrence and mortality at different ages.

Ages of patients when operated upon.	Number of cases.	Per-centage.	Recoveries.	Deaths.	Per-centage fatal.	Proportion fatal.
2 years.	6	2·60 per cent.	5	1	16·66 per cent.	1 case in 6
3 "	21	9·13 "	21	—	—	—
4 "	23	10· "	23	—	—	—
5 "	23	10· "	21	2	4·34 "	1 case in 11½
Between 5 & 10 yrs.	56	24·34 "	53	3	5·34 "	Under 10 years of age 129 cases; 6 fatal, or 1 in 21½.
	31	13·47 "	29	2	6·45 "	160 cases; 8 fatal, or 1 in 20.
	18	7·82 "	15	3	16·66 "	1 " 18½
	13	5·65 "	11	2	15·38 "	1 " 15½
	7	3·04 "	6	1	14·28 "	6
	7	3·04 "	3	4	57·14 "	6½
	19	8·26 "	8	11	57·89 "	38 cases, 6 fatal, or 1 in 6⅔.
	5	2·17 "	2	3	60· "	7
	1	·43 "	—	1	100· "	1½
						1 " 1
	230	99·95 per cent.	197	33	14·34 per cent.	32 cases; 19 fatal, or 1 in 1⅓.
						1 case in 7.

Analysis of Cases admitted within the last seven and a half-years.

Forty patients were admitted with symptoms of stone, but in none of which could any be detected on examination, and all left relieved by treatment.

In 2 cases the calculus was passed per urethra.

In 17 cases lithotrity was performed, and 1 died.

In 96 cases lateral lithotomy was performed, 14 proving fatal.

In 2 cases lithotomy was called for after lithotrity had failed, 1 case dying.

In 5 cases median lithotomy was executed, and in these cases death followed, the operation having been solely undertaken to afford relief.

In 2 cases median lithotomy was performed for prostatic calculi.

In 1 case the recto-vesical operation was successfully performed for a very large calculus.

In 9 cases no operation was deemed justifiable, on account of the presence of some organic disease, 3 dying of renal disease while in the hospital.

The total number of cases of calculus vesicæ being 134, 22 of which died.

CLINICAL SURGERY.

ON

TUMOURS, AND TUMOURS OF THE BREAST,

MORE PARTICULARLY IN REFERENCE TO THEIR DIAGNOSIS.

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MDCCCLXIV.

ON TUMOURS.

BY THOMAS BRYANT.

IT is not my intention on the present occasion to enter minutely into the pathology of the new growths denominated in surgical language tumours, for this has been already well done by modern pathologists, such as Paget, Wilks, Birkett, and others. But, as it is my object to enter into the subject of their diagnosis, and to point out the principal features by which one tumour may be distinguished from another, it will be necessary for such an end to dwell briefly upon the chief characters belonging to their different varieties, and to consider the leading pathological facts connected with their history, development, and growth. In doing this, I shall condense my observations within the narrowest possible limits, seeking to discover the principles on which the development of these structures appear to be based, and the leading features by which they are characterised, rather than the minute differences in their anatomy, or the minor symptoms by which their development may be attended—looking at their pathological features more as a means of diagnosis than as a scientific pursuit, and applying, as far as it lies in my power, the results of scientific knowledge and investigation to purely practical purposes.

CHAPTER XLIX.

ON SOME POINTS IN THE PATHOLOGY OF TUMOURS TENDING TO
ILLUSTRATE THE SUBJECT OF THEIR DIAGNOSIS.

As a leading pathological principle it may, I think, be unhesitatingly asserted, "*that all tumours, with the exception of the hydatid, are made up of one or more of the natural elementary tissues of the body, and that in no single example has any extraneous or new element been ever detected.*" For just as the natural body is built up of cells and fibres in one or other of their different forms, so tumours are made up of like elements, although it may be in unequal proportions. Tumours, like the natural tissues, differ, therefore, anatomically, according to the nature of the elementary structure of which they are composed; and this again appears to be materially determined by the part of the body in which they are developed.

From this, therefore, a second leading principle may be fairly drawn, "*that all tumours partake of the nature of the part in which they are developed, and are more or less made up of the elements which naturally enter into its formation.*"

Thus a tumour developed in the stroma of a fibrous structure will probably be fibrous, if connected with bone more or less osseous, and if situated in a gland, it will in all probability partake of the gland structure.

The bearing of these pathological principles upon practical matters is by no means unimportant; for to the surgeon, who has once recognised the true position of a tumour, there is a certain amount of probability as to its nature which will at once suggest itself to his mind. If the tumour be situated in the skin or subcutaneous tissue, there is a strong probability that it will be composed of some one or other of the structures of the tissue. It may be the sebaceous—which is never found in any other position—or the fatty, for these two materials enter largely into cutaneous structures; or it may be one of the

fibrous or fibroplastic nature—fibre-tissue existing freely also in these parts.

Should the tumour be located between the muscles of a part, there is again a probability as to its true nature, which will naturally suggest itself; for, as cellular tissue alone exists in these parts, the tumour will probably be composed of some of its elements, and these, being formed in excess, will give rise to the growth of a fibro-plastic tumour. Should bone, again, be the seat of the disease, some one of the elements of bone will, to a certainty, enter into its formation; the probability of its being an enchondroma, osteoid, or myeloid tumour, naturally presenting itself. And, lastly, should a tumour be present in a gland, such as a breast, uterus, or prostate, the probability of its being an adenoid cannot be overlooked; for pathologists now all recognise the fact of the close resemblance of tumours so situated to the natural gland structure.

These remarks, however, apply principally to simple tumours; for it must be borne in mind that cancerous or embryonic cell tumours may exist in any part, cells entering naturally into their formation.

All tumours are either simple or cancerous, innocent or malignant; the simple or innocent approaching in their nature the more highly organized natural structures of the body, even to the perfect glandular; and the malignant or cancerous simulating the most elementary or embryonic; for, as the normal tissues were formed from a simple cell, and those of a higher grade from its development, so the cancerous element is a simple cell, or the undeveloped embryonic nucleus.

In proportion, therefore, to the amount of the cell element in a tumour may its cancerous tendency be determined; and the greater the proportion of the fibrous or well-developed structure, the greater the probability of its nature being innocent or simple. The more a tumour simulates the natural structure of a tissue or gland, the greater is the probability of its being innocent; the more a tumour simulates the undeveloped cell structure, the greater the certainty of its being cancerous.

The formation of simple or innocent tumours is, therefore, to be explained by the unnatural growth or collection of some

one or other of the simple natural elements at one spot; and the formation of the cancerous tumour is to be accounted for by an undue growth and repetition of the embryonic cell or nucleus, which should naturally have passed on to the development of higher structures.

Tumours never change their original nature, nor pass on nor degenerate into others of a different kind. A simple tumour is simple to the end, and a cancerous tumour is cancerous from the beginning. This opinion is a pathological fact, which it would seem unnecessary in these days of advanced pathology to lay stress upon; but, oddly enough, an opposite opinion is still repeated in some of the students' text-books, and this being the case, the truth may be again enforced. The above lines are not intended, however, to convey the impression that a patient, the subject of a simple tumour, may not become the subject of a malignant one, or *vice versa*, for such may unquestionably be the case; and after the removal of a simple tumour a malignant one may secondarily make its appearance. But no simple tumour by growth or degeneration will become malignant, as no malignant tumour will become innocent. It would appear, however, that in recurring innocent tumours there exists a tendency for such growths to present on each return, more the elementary character of the malignant growth. *Simple tumours separate tissues in their growth, but never infiltrate; cancerous, as a rule, infiltrate, and rarely separate.* No more important practical point can be brought forward to aid the surgeon in his diagnosis of a tumour than the above. For a simple or innocent tumour, however long it may be in growing, and however large a size it may attain, will never do more than separate the parts between and beneath which it may be developed.

The bones may be absorbed by its pressure, but they will never be involved; and the skin may be so stretched and attenuated by its distension as to ulcerate or burst, but it will never be infiltrated with the tumour's elements. This fact is well exemplified by a close examination of the margin of a cutaneous opening, the result of over distension; for it will appear as if cleanly cut, or rather punched, at its edges, and never thickened or diseased.

With the majority of the cancerous tumours, however, a very

different condition has to be described, for a cancer has the peculiar property of freely infiltrating all the tissues upon which it presses, and when near the skin this becomes rapidly involved. As the tumour approaches the surface, the integument first appears to be drawn down to it, and afterwards as though glued to its surface. At a later stage the skin becomes infiltrated with cancerous elements, and to the finger feels firm, fibrous, or tuberculated, and when ulceration has commenced, the edges of the skin are palpably indurated, thickened, and infiltrated with cancerous products.

The contrast between these different conditions of integument in the two classes of tumours is most marked and very important, forming a most valuable means of diagnosis in the extreme stage of simple or malignant tumours.

Simple or innocent tumours affect the patient solely through their local influence, and have no tendency to multiplication in other tissues, nor to involve the absorbents with which they are connected. Cancerous tumours not only affect the patient through their local influence, but have a marvellous tendency to multiplication in any part of the body, more particularly in the internal parts, and never exist for any period without implicating the lymphatics of the part with which they are connected.

This difference between the two classes of cases is most important, and forms a very valuable means of diagnosis even in an early condition of disease; for in a case of tumour, the nature of which is doubtful from both its local and general conditions, the presence or absence of an indurated absorbent gland (not an inflamed one) will weigh down the balance of doubt, and tend more strongly than anything else to solve the problem; for it is as rare to meet with indurated glands in a simple tumour, as it is rare to miss them in a cancerous.

With these few preliminary remarks respecting the development of tumours generally, I will now pass on to consider the different varieties, treating of them in classes.

CHAPTER L.

ON THE SEBACEOUS OR STEATOMATOUS AND EPIDERMAL TUMOURS.

SECTION I.

THESE sebaceous or epidermal cutaneous cysts are doubtless the glandular or adenoid tumours of the integument. They are found only in these parts, and are composed of the peculiar elements of skin structure, containing the secretion of the skin itself, the sebaceous matter, and in some instances even the growth of higher development, viz., hair. They may spring up in any part of the body which is covered with integument—may occur at any age and in any sex, although it appears as if women were the more liable, forty-three out of the sixty-seven cases of which I have notes belonging to this sex. In a measure they are certainly hereditary, and have a strong tendency to multiplicity, but only as cutaneous tumours.

I possess the records of sixty-seven examples, and the following is a brief analysis of their histories :

In 43 of the 67 cases, the tumours were in women.

54 cases, the growth was upon the head or neck.

6	"	"	on the arm or hand.
1	"	"	upon the hip.
3	"	"	on the labium.
1	"	"	behind the anus.
1	"	"	upon the sternum.
1	"	"	at the umbilicus.

In all of these the tumour was treated by excision with complete success, and in no single example did erysipelas, or any other evil result follow from such a practice.

Formation of the Sebaceous Tumour.

These tumours are probably in a large proportion of cases formed by an obstructed follicle, for in some exceptional examples the contents may be squeezed out through the visible orifice and the cyst emptied ; such instances are, however, of rare occurrence, and it would rather appear as if a certain num-

ber of cases are really new formations. In some instances the tumour, although beneath the integument, has no connection with it, and is without doubt an independent cyst; and in the congenital sebaceous tumours there can be no doubt as to this being their origin, for these are quite independent, and what is more, almost always contain hair.

Fungating Follicular Tumour.

In neglected examples of this disease, the contents of the tumour may soften down, and, causing suppuration, escape externally by ulceration; from the inner surface of these evacuated cysts a new growth may spring up, which is of a peculiar nature, and this forming an irregular, fungating, bleeding surface, at times puts on an appearance which has been mistaken for cancer. On examining the edges of the wound, however, this mistake can hardly be long entertained, for it will be at once observed that the edges of the wound are healthy, and not infiltrated with new matter, as would be the case in a cancer; and it is thus tolerably clear that this irregular fungating growth only consists of exuberant granulations from the cyst itself. An excellent account by Mr. Cock of this peculiar follicular tumour will be found in the 'Guy's Reports' for 1852.

The diagnosis.—From what has been already stated it will be gathered that there is not much difficulty in the diagnosis of a sebaceous tumour. Being a purely cutaneous development, its features are peculiarly exposed to observation; and when originating in an obstructed follicle, the true nature of the disease becomes most apparent, for the tumour is situated in the integument, and the closed orifice of the duct may be detected. It is only in exceptional cases, however, that the orifice of this obstructed follicle will be observed; but in a larger proportion of cases, on making an attempt to separate or raise the skin from the tumour, a dimple or evident connection between the two will become apparent, thus revealing its true cutaneous origin and pointing out its pathology. In other cases, however, no such obstructed duct, or even cutaneous depression will be observed; and although the tumour may be developed within the integument, another ex-

planation of its origin must be looked for. That this cyst is, under most circumstances, of independent growth, hardly admits of a doubt, and the truth of this opinion is strongly supported by the development of the congenital form of the disease, for these congenital cysts have the peculiarity of being more deeply situated than the other forms, such growths generally lying beneath the deep fascia, and sometimes beneath the muscles, this latter position generally being maintained when the cyst is placed in the neighbourhood of the eye—a very common seat. These congenital cysts also almost always contain hair, either in a mass, or as fine hairs, like the eyelashes. Such cysts, so placed beneath the muscles, cannot therefore be formed by the retained secretion from an obstructed duct, and it is not therefore difficult to understand how the same tumour may be formed at a later period of life. These tumours are also always globular, being evidently cystic. Their manipular indications vary considerably, differing according to their contents, being tense and firm in some cases, and pulpy in others; and in some they are so doughy as to be capable of being altered in shape by external pressure.

Treatment.—The only correct treatment of these cysts, whether whole or broken, is their removal by excision. It is needless to be too careful in dissecting the cyst out entire, as was formerly done, the most expeditious method being to slit open the tumour with a bistoury, and turn it out with the forceps or handle of a knife. This plan is rapid and effective, and far superior to the older and unnecessary one of a steady dissection.

In children, however, they may frequently be squeezed out of their bed by the thumb and finger. In an interesting case which came under my care in 1855, this disease and this plan of treatment was well shown: a female child, only five months old, was brought to me with its head studded with these tumours, varying in size from a pea to a large nut, and some of them were suppurating; many were squeezed out and others excised, recovery following.

The fear of erysipelas after these excisions appears groundless, as I have already shown that no such complication appeared in any one instance; and on a former occasion I

also showed that after scalp wounds erysipelas was equally rare.

SECTION II.

ON FATTY TUMOURS.

Wherever fat exists naturally in the body a fatty tumour may be formed, and as this material is more especially deposited in the integument, it is in and beneath this that fatty tumours are the most frequently found. They occur at all periods of life, from infancy to old age, and are even congenital; they attack the male sex as well as the female, but are by far the most common in the latter, sixty-three cases out of eighty-five being found in women. They are generally single, but in many cases two or more exist; some rare cases being recorded in which the whole body was studded with them—one of which I have seen. As a rule, they are found connected with and beneath the skin—rare examples occurring in which they are seen separating the muscles.

I have the notes of eighty-five examples of fatty tumours.

24 of these were situated over the deltoid muscle.

6	"	"	"	clavicle.
8	"	"	"	scapula.
7	"	"	"	arm, or forearm.
15	"	"	"	thigh.
17	"	"	"	trunk.
8	"	"	"	neck.

As already stated, sixty-three of these cases were in women and twenty-two only in men.

It is impossible to assign any true cause for their development; and, though patients often attribute them to a blow, there is no good evidence of such being a sufficient cause, and therefore no reason for such an assumption.

These tumours are generally troublesome only from their position and the deformity they occasion; at times they appear also to cause much pain: but such a symptom, I imagine, must be looked upon as an accident of their position.

Their excision is the only correct treatment. It was carried out in nearly every case which I have recorded, and death

followed in only one instance, the details of which are as follows:—

CASE 1.—*Excision of a Fatty Tumour—Death.*—A pale, but otherwise healthy looking woman, æt. 50, was admitted under my care into Guy's Hospital in December, 1859, with a large fatty tumour the size of a child's head, over the right scapula. It had been growing for thirty-five years, and, as it had been causing her considerable pain for many months, and from its size was troublesome, she came up from the country to have it excised. The operation was performed, under the influence of chloroform, without difficulty, and very little blood was lost, but the patient never rallied completely, and sank exhausted on the sixth day.

After death the viscera were found to be surrounded with fat, but healthy, with the exception of the kidneys, which were small and granular. The urine, however, was not albuminous.

The death of this patient made a great impression on me, and I ascribed it more to the influence of chloroform than the operation.

The Shifting of Fatty Tumours.

The fact that fatty tumours shift their position is now generally recognised, and as this feature is peculiar to growths of this nature, it is a point of value in the diagnosis of difficult cases.

I have seen two good examples of this kind; one in a man, aged thirty-nine, who had been the subject of a fatty tumour in the neck for four years, and was admitted into Guy's, under the care of Mr. Birkett. The tumour, when it first appeared, grew from behind the ear, and gradually shifted downwards on the neck, till it lodged over the thyroid body, where it was seen on his admission, being then the size of a good fist.

The second case was in a middle-aged man, who had been the subject of a tumour for years; when first observed it was growing over the hip-bone, and as years passed on, it shifted down to the middle of the outer side of the thigh.

Multiple Fatty Tumours.

It has been already stated that fatty tumours, although as a rule single, in rare cases are more numerous, and the following is a good example of such an occurrence.

CASE 2.—A woman, æt. 34, was admitted into Guy's under the care of Mr. Cock on September 10, 1859. She had been the subject of tumours over her body for six years, but for the last eleven months they had multiplied rapidly. When admitted, the whole body—both trunk and extremities—was studded with such growths, all being of different sizes.

Deep-seated Fatty Tumour.

I have seen but one good example of fatty tumour beneath the muscles, and that was in a boy aged nine years. The tumour had been growing about six years, and was situated in the posterior portion of the thigh, beneath the flexor muscles. It was excised by Mr. Cock with complete success.

Diagnosis.—The diagnosis of a fatty tumour as a rule is not a task of difficulty; the majority of cases, being situated in the integument, presenting symptoms which may be regarded as characteristic.

With rare exceptions these tumours are lobulated and encysted, that is, are defined by a distinct boundary, their cyst wall being formed by the condensed fibro-cellular tissue in which they are developed. Being developed in the cellular tissue beneath the skin, the integument is necessarily more or less involved, and it will not, therefore, roll over the tumour with freedom and facility. To the hand of the examiner the tumour will feel more or less firm, and probably made up of lobes; and to the eye the skin will, on pinching up the tumour from its base, appear dimpled, and in parts drawn inwards towards the new growth—this last appearance being very characteristic of a fatty tumour, and when once observed almost sufficient in itself to settle the diagnosis.

Diffused Fatty Tumours or Outgrowths.

The appearances just given are found in the ordinary lobulated and encysted fatty tumour, as well as in the more rare and curious forms first described by Sir B. Brodie as the fatty outgrowths; but in these latter there is no distinct outline, and no boundary, "and you cannot say where the natural adipose structure ends and the morbid begins." These cases are not, however, at all common. I have seen one example in the male adult, aged forty-one, in whom the outgrowth was in the neck, and of four years' growth, the tumour appearing as one great fold of fat and integument around the nape of the neck, or beneath the jaw. The subject of it was a patient of Mr. Cock's. I have observed several others in young children, some of a very extensive kind. Their diagnosis is not, however, difficult, their external appearances being the same as in the encysted variety, and presenting an equally dimpled surface. Their treatment also is the same, excision being the only available plan. It has never fallen to my lot to witness any decrease in a fatty tumour by the internal use of alkaline or any other medicine.

A male child, *æt.* 2, was admitted into Guy's under the care of Mr. Cock, in August, 1855, with a diffused fatty tumour over the right major trochanter of the thigh; it had no boundary, but gradually disappeared in the tissues. Mr. Cock cut down upon it, and excised a large portion of the growth, which was composed of small lobules of fat in cellular tissue, and the wound healed kindly.

In the same year a like case occurred in the practice of the same surgeon, in a boy aged five years. The diffused growth was spread over the occipital protuberance, and was three years coming. It was also excised, and was made up of the same material as the last. Convalescence followed.

In 1857, a male child, *æt.* 6 weeks, came under my care with a diffused congenital fatty tumour around the right elbow joint, increasing with his growth; and at the present time I have another similar case under my care, in a male child one year and a half old; the tumour occupying the left axilla and side of the chest.

CHAPTER LI.

SECTION 1.

ON CERTAIN FORMS OF CYSTIC TUMOURS.

IN the following chapter I propose to make a few observations on certain forms of cystic tumours, confining my remarks to such examples of the disease as possess fluid for their contents. Pathologically speaking, this division may be incorrect and unscientific, for the sebaceous or fatty tumours are also cystic, as are many other forms of tumour of the breast, testicle, &c.; but practically this division is of some convenience. I do not hesitate, therefore, to adopt it on the present occasion.

The majority of these cases are simple cysts, and are made up of a cell-wall and its fluid contents, this fluid varying much in its nature; in some being simply serous, more or less stained with blood, in others of a more tenacious nature, and of the character of mucus, or like the white of egg; in others, again, the fluid of the cyst may contain cholesteroline, or altered blood, or some other material; and lastly, the cyst may be an hydatid in one of its forms.

Mucous Cysts of the Mouth.

At the mucous orifices of the mouth and vagina cysts are by no means uncommon. They appear upon the lips or inner margin of the mucous membrane as tense globular tumours, and are now generally believed by pathologists to be formed by an obstructed mucous follicle. They evidently contain inspissated mucus, and are readily treated by a simple incision into their interior, and evacuation of their contents; means being subsequently adopted to excite inflammation of their walls, and eventual destruction, by either plugging the cyst cavities with lint, or by applying to their surface some caustic or escharotic, as the nitrate of silver, chloride of zinc, or nitric acid. The simple plan of plugging with lint, however, is very effectual. In some cases the cyst may be excised, and when this can be done it is the most cer-

tain plan of treatment, but it is not always practicable. I have treated several examples of this disease of the lips by simply plugging the cyst with uniform success; and in other instances I have excised the cyst, but the former treatment is, as a rule, the best.

Mucous Cysts of the Vagina.

Cystic formations, precisely analogous to those just described, are found also at the orifice of or within the vagina, and at times these grow to a large size. I have seen one as large as a good fist, of four years' growth; a second, of equal dimensions, in a woman aged thirty-nine, in whom it had existed for twelve years; a third case, of nearly equal size, of ten years' growth, in a woman aged thirty-two; and a fourth instance in which both labia were similarly affected. In all of these the diagnosis was tolerably easy; the cysts were more or less globular, from fluid distension, fluctuating and tense. In all of these examples extirpation was carried out, and with success.

In other cases, however, in which the cyst is of smaller dimensions, it is hardly necessary to extirpate the growth, its simple incision and plugging with lint being all that is necessary. I have successfully treated many cases by this plan, and, unless the cyst be large, would recommend its usual adoption.

The contents of these vaginal mucous cysts vary considerably; in one of the cases quoted the fluid was of a coffee-ground nature; in a second, it was milky; in a third, it was of the consistence of mucus; and in one instance I have lately treated, the fluid was black, thick, and tenacious; in the majority of cases, however, it is either serous or of the nature of mucus.

It would be inconsistent with my design to dwell upon the other forms of mucous cysts, and more particularly the sublingual, usually described as ranula, for I have already, on a former occasion, treated of its pathology as well as of its treatment, and refer to it here simply as another form of mucous or cystic tumour.

On Bursæ and Synovial Cysts.

The enlargement of the natural bursæ by effusion into their interior, or the formation of an artificial bursa exactly corresponding in its character with a normal one by the effusion of fluid into the condensed areolar tissue of a part, are other varieties of cystic tumours which demand a passing notice. The natural bursæ exist usually over joints, and those over the patella and its ligament and the olecranon process are the most commonly enlarged. The artificial may be formed at any spot which is subjected to constant or prolonged pressure, and is evidently an attempt of nature to neutralise the results of a force which might prove injurious to the tissue by its continuance; the bursa of a bunion being the most common example. These enlarged bursæ, therefore, form tumours which are more or less globular in shape and more or less solid in their nature, varying from thin cysts to an almost solid and apparently fibrous tumour. But these indurated cysts always have a centre in which fluid exists, thus proving their nature and origin. Their contents vary from a thin serum to an almost pure blood; fibrine in different degrees of quantity occurring in most.

Diagnosis.—There can be little difficulty in the diagnosis of a natural bursa, or even of the artificial, if the surgeon bears always in mind the fact that they do occur in certain positions, and may occur at any spot subjected to constant or prolonged pressure.

As already stated, they are, as a rule, globular; but to this there are many exceptions found in practice. They are generally also to the touch more or less fluctuating, some of the cysts being quite thin and baggy, whilst others may be tense or firm, so as to feel of a fibrous nature; and a third class may, as already mentioned, put on the appearances and manipular indications of a solid tumour. An error in diagnosis, however, can rarely take place if average caution be employed in the attempt.

Treatment.—In the early stages of a chronic enlargement of a bursa the application of a blister is the best practice; and this may be repeated if the effusion has not been reabsorbed.

Iodine, as an external application, appears perfectly useless, and I always regard its employment as waste of time. Should the blistering treatment fail to effect a cure, the introduction of a seton is to be recommended; the seton being left in to excite inflammation and suppuration of the cyst-walls. Should suppuration be profuse, the bursa must be opened; but this practice is seldom called for. When the bursa has indurated and put on the appearance of a solid tumour, its excision is the only correct practice. The changes which take place in a bursa to produce a cystic tumour are of a chronic nature, and are also-inflammatory. When acute inflammation attacks a bursa, a very different train of symptoms, with external and manipular indications, would have to be recorded if it were consistent with my design to enter upon the point; but it will suffice, if I add, on the present occasion, that it is to an acute inflammation of one of the superficial bursæ that nearly, if not all cases of suppuration about an articulation are to be attributed; the inflammation and suppuration originating in one of the natural bursæ, and spreading laterally to the cellular tissue, in some cases thus involving the whole cellular tissue external to an articulation.

On the Ganglionic Tumour.

Cysts or ganglia are very frequently formed about the sheaths of the tendons, although their true pathological nature may be somewhat difficult to determine. They appear, says Paget, "to be the cystic transformation of the cells inclosed in the fringe-like processes of the synovial membrane of the sheaths," and the results of dissection appear to justify this opinion. They are most frequently found about the wrist-joint, but may form in any part in which a tendon exists. They show themselves generally in unilocular or multilocular cysts in the course of the tendon, and may be tense or flaccid, according to the nature of their contents or the amount of distension, and are more or less fixed, according to circumstances. They may involve a single tendon or many; and in one case now under my care every carpal tendon is the seat of the disease.

Treatment.—In the treatment of ganglionic tumours, considerable difficulty is often experienced. They may be dispersed by various means, but the tendency these cystic tumours have to return is so great, that in some instances, in spite of all care, they will reappear.

If the ganglion can be ruptured, such treatment should be carried out, and the best method appears to be by pressure, the hands of the surgeon grasping the wrist, and the thumbs superimposed firmly pressing on the ganglion, previously made tense by the extension of the tendon.

The application of a blister over the part after rupture appears to expedite the cure, although I have rarely seen any good from its use without such treatment.

If these means fail, the passage of a seton through the growth is the best plan to adopt; but this practice is attended with some risk, and should not, therefore, be carried out unless a necessity exists; the hand or extremity should, at the same time, be kept at absolute rest, to check and control inflammatory action. Should acute suppuration follow this practice, an incision into the tumour should not be neglected, for the matter is liable to extend up the sheaths of the tendons, and this should therefore be carefully guarded against.

I have treated many cases by this plan, and have never seen any evil follow; but as surgeons still record their fears of an evil result, it is as well to bear the fact in mind. In rare cases, in which complete consolidation has taken place, excision must be performed, extreme care being taken in the dissection that the tendon be left uninjured, and that perfect repose of the part be subsequently maintained during its repair. Cases requiring such treatment are, however, few and far between.

I have seen a ganglion upon the flexor tendon of the index finger of an infant eight months old, and on the flexor carpi radialis tendon of a child four years of age; but they may be seen at all ages.

SECTION II.

ON CYSTS OF THE NECK.

Cystic tumours of the neck may occur as independent formations, or in connection with the thyroid body. When

developed as independent tumours they are usually, although not invariably, single, possess thin walls, and may grow to a large size. They may appear as superficial cysts, being simply covered by skin and fascia, or, what is more common, they may possess deep attachments, apparently in some cases passing downwards beneath the muscles to the spine itself.

They are seen at all ages, and are even congenital. My colleague, Mr. Birkett, in the Guy's 'Reports' for 1860, has given an admirable description of these tumours, and has entered minutely into their pathology. He there gives an example of such a congenital formation.

CASE 1.—*Congenital Cyst in the Neck.*—A similar example came under my care in September, 1861, in a female, E. C—, æt. 16, who was born with a tumour above the right clavicle, passing up from beneath the sterno-mastoid muscle. It was described to me by the mother as soft, and like a bag of water, and after a few months, emptied itself completely, a cupful of a clear fluid passing away. The wound soon, however, healed, and the cyst again enlarged, but slowly, and without pain, for it was not till the child was five years of age that it was tapped by a surgeon; fluid of the same character was again drawn off, and with a like result, for when eleven years of age the cyst had refilled, and was again tapped. When I first saw her another five years had passed away, and it was evident that a cyst existed, passing forwards from behind the sternocleidomastoid muscle above the left clavicle. I tapped it, and drew off two ounces of a clear, highly albuminous fluid, and through the canula passed a seton through the cyst wall; some inflammation and suppuration followed, and the cyst contracted, the patient, when last examined, three months subsequently, being apparently well.

In this interesting case the cyst was evidently congenital; it grew slowly, and its development was unattended by pain, a practical point which is generally to be observed in the growth of such formations.

Treatment.—In the treatment of these cystic tumours, or, as they have been called, hydroccles of the neck, there is now

little difference between surgeons as to the soundest practice to be pursued, this consisting in leaving them alone, unless there are strong and powerful reasons for interference. If the cyst be small and superficial, there can be no objection to a more active treatment, for the chief danger of interference lies in the fear of an acute inflammation spreading from a deep-seated cyst to the cellular tissue of the neck, and as a large proportion of these cysts are developed beneath the muscles, this danger is very real; as a practical deduction it may, therefore, be asserted, with some confidence, that in deep-seated cystic tumours of the neck the best thing is to leave them alone.

Should, however, some interference be imperatively demanded, either from the size of the tumour or from the pain and symptoms with which it is attended; the puncturing of the cyst with a trocar and canula, and the evacuation of the fluid, is the soundest practice, this operation being repeated as occasion may demand. This proceeding is not altogether free from danger, for many cases are recorded in which a fatal effect was the result, and an instance occurred in my own practice, six years ago, illustrating the fact.

CASE 2.—*Cyst in the neck; tapping, with a fatal result.*—A woman, æt. 40, applied to me, at Guy's Hospital, with a cystic tumour of the neck, on the right side. It was not, apparently, deep-seated, but as it caused her considerable annoyance and some pain, I was induced to tap the cyst, drawing off about one ounce of a blood-stained fluid. The woman returned home, and I heard nothing more of her for some days, when a friend of her's called to tell me of her death, which took place four days after the operation, the inflammation spreading from the cyst to the neck generally, and destroying her by suffocation. I tried to procure particulars of the case from the medical man who was called in, but could not succeed. This case caused me considerable vexation at the time, and was valuable as an illustration of the evil effect which will sometimes follow such an apparently innocent operation as the simple tapping of a cyst of the neck.

In the example of congenital cyst already quoted, the benefits of the introduction of a seton are favorably shown; but it must

not be supposed that this good result can always be secured, for the danger of acute inflammation of the cyst and the neighbouring cellular tissue, is as great after this operation as after the former, and the greatest care should be employed in carrying it out. The operation of incision into the cyst, and its extirpation, is also equally hazardous, and should be done only in cases in which the cyst is small, and then only when imperatively demanded. Injections of iodine, as a primary treatment, are also to be dreaded, and should therefore be employed in only exceptional cases.

What, then, should be the treatment of these interesting cases? and what are the means to be adopted by which a permanent cure may be ensured?

I have already stated that the simple puncturing of the cyst is the soundest practice to be followed when a necessity for interference positively exists; and I have also advised that this operation should be repeated as soon as a re-collection of the fluid has taken place. As a rule, after several tapplings of the cyst, the nature of the fluid becomes altered, and the cyst wall materially contracts; and when these changes have taken place, the opening may be permanently established by the introduction of a perforated india-rubber tube, or drainage tube as it has been called. By these means the cyst will gradually collapse and contract, and a cure result. Mr. Birkett, in his valuable paper already alluded to, has given some interesting cases illustrating this point, and having had the opportunity of observing several of the examples, I can with confidence recommend the treatment.

The following case of congenital cystic tumour of the neck will also be read with interest. It occurred in the practice of Mr. Cock.

CASE 3.—Congenital cyst in the neck; tapping; recovery.—A female child, æt. 9 months, was admitted into Guy's Hospital in July, 1856, with a congenital cystic tumour above the left clavicle, of very large size, and requiring relief. The cyst was punctured, and several ounces of serum stained with blood drawn off. On the fifth day the child was taken home, the tumour having nearly disappeared. In a few days, however, the cyst inflamed, and the child was re-admitted, when a free

opening was made into the tumour, and a quantity of pus escaped; from this time everything went on well, and the child left the hospital convalescing.

The following example also of hydrocele of the neck is worthy of record on account of its extreme size; it occurred in the practice of Mr. Poland.

CASE 4.—*Very large cyst in the neck.*—A boy, æt. 13, was admitted into Guy's in July, 1857, with a large cyst on the right side of the neck, evidently unconnected with the thyroid gland; it was tapped, and a pint of thin serous fluid drawn off, giving much relief, after which the boy left, and no further record exists.

SECTION III.

ON CYSTS IN THE THYROID GLAND.

These cysts are unquestionably more common than the variety we have just described, and they differ from the last also in the fact that they are generally multiple, although it is usual for one cyst to be larger than the others, and, as a consequence, to be the source of special observation.

They are diagnosed without much difficulty, for when the patient swallows fluid or saliva, the cyst moves upwards with the larynx, and when this occurs, the surgeon may with confidence conclude that the tumour is in the thyroid. It should be added, that the other forms of hydrocele of the neck which I have described, are never influenced by deglutition; consequently this distinction between the two varieties becomes valuable for diagnosis.

These thyroid cysts vary much in size, and acquire, in rare instances, very large dimensions; specimens existing in the Guy's museum several inches in diameter, three or four being by no means uncommon.

The cyst contents also vary extremely, being in one case serous, and more or less blood-stained; in others of a tenacious and gummy nature, while, in rare examples, the cyst contains almost pure blood. At this present moment I have under care an interesting example of this disease illustrating this fact, and the following is an outline of the case:

CASE 5.—*Blood Cyst of the Thyroid.*—A woman, æt. 26, came to me, on April 6th, 1863, with a large cyst, the size of a cocoanut, on the right side of the thyroid gland. It had been growing three years, and at times had increased more rapidly than at others. For some weeks the tumour, from its size, had interfered both with deglutition and respiration, and had thus called for some operative relief. The woman was, unfortunately, seven months gone with her third child, rendering any operation somewhat dangerous. On April 7th I tapped the cyst, and drew off twelve ounces of almost pure blood, the fluid coagulating freely after it had escaped; this flow of blood would apparently have gone on to the exhaustion of the patient had I not removed the canula. On doing this, the flow ceased, but the size of the tumour was rapidly restored. Nothing more could consequently be done; the woman went home to be confined, and I have lately heard all passed off well. She is coming up again for further treatment.

Treatment.—The excision of these cysts is a practice which cannot be recommended, for it is an operation of considerable danger as well as difficulty, and needs, therefore, no further consideration. Other means are open, however, to procure the obliteration of the cyst, and many have been tried. The cyst may be freely incised and plugged with lint, as practised in other cases to which we have already alluded; but the results of this practice are not encouraging, and its dangers are also too great to warrant its recommendation for general adoption. The introduction of a seton through the tumour is another method which has been followed, but it is one with which I am little familiar, and I must confess to having fears of such a practice being too dangerous. The best plan to effect a cure I believe to be by tapping, and the subsequent injection of the cyst with iodine; but this treatment is only applicable to the smaller cysts, as, in the larger kinds the danger of exciting acute inflammation in the cyst walls is too great to warrant the general adoption of such a method. In these severe cases I should prefer the plan of treatment recommended and described in the hydroceles of the neck, namely, repeated tappings of the cyst, and the subsequent introduction of the drainage tube. By this practice the cyst will gradually contract, and a cure may be looked for with some confidence.

I may again refer, with pleasure, to Mr. Birkett's paper in the Guy's 'Reports' for 1861, for a good exposition of this subject.

CASE 6.—*Cyst in the thyroid; tapping; recovery.*—Two cases illustrating the successful treatment by iodine injection have passed under my notice. One occurred in the practice of the late Mr. Aston Key, and I was the dresser to the case. It was in a female, æt. 12, who had a cyst situated in the isthmus of the thyroid gland, about one inch in its largest diameter. The contents were removed by tapping, and iodine injected. A cure resulted.

CASE 7.—*Cyst in the thyroid; injection with iodine; recovery.*—The second case occurred in my own practice in May, 1860. It was in a healthy woman, æt. 27, who had a cyst developed in the right side of the thyroid gland, of six years' growth. It was about the size of a small orange, and quite globular, having increased somewhat rapidly for the last two months. It had not caused her any inconvenience until quite recently, when it had rather interfered with her power of deglutition. The cyst was punctured with a trocar and canula, and rather more than an ounce of thin serous fluid, of the palest yellow tint, and slightly tinged with blood, escaped. In June the cyst had refilled. It was again punctured, the same kind and amount of serum were abstracted, and one drachm of the compound tincture of iodine was injected through the canula. Some inflammation of the cyst was excited, sufficient to consolidate it. The induration was subsequently absorbed, and the disease cured in about two months.

The results of this plan of treatment in the case quoted is encouraging, for it is both useful and successful. From one to two drachms of the compound tincture of iodine is the right form for injection.

CHAPTER LII.

ON HYDATID TUMOURS.

ONE of the most interesting subjects of speculation connected with the development of tumours is involved in considering the growth of the hydatid. For no good explanation

has yet been given either of their origin or of the mode by which those entozoa gain an entrance into the tissues of the body, although the investigations of Siebold and others have thrown some light upon these points. That they do gain admission from without is now no longer a subject of doubt; and the largest proportion of the hydatid cysts found in the body are connected with the abdominal or pelvic viscera. A few cases occasionally occur in practice, in which the integumental or intermuscular tissue is the seat of the disease, but these cases probably form only a third part of the examples of hydatid tumours.

As surgeons we are called upon to treat all these forms of hydatid tumours, but it is the last variety alone which demands our attention on the present occasion. Cystic tumours made up of hydatids may be of any dimensions, and some grow to a very large size; they may occur at all ages and in any part of the body, and are known by their gradual growth, painless character, and peculiar hard, stony, and globular form, their shape, however, being materially modified by the position in which they are placed, and being unconnected with any tissue, they simply separate parts in their growth by a gradual expansion. If formed beneath the integument only, they assume the globular shape, and roll beneath the finger like a marble, being when small remarkably hard from the tension of the cyst. If situated beneath the superficial tissues and between the muscles, they are very resisting, are quite as tense as those last described, and cause pain only when pressing upon any of the nerve trunks. They are of inconvenience, therefore, simply from their position, and require treatment on account of the mechanical inconveniences they cause.

The difficulty of diagnosing with anything like accuracy the presence of one of these cysts is, nevertheless, very great. When a subcutaneous tumour exists, however, evidently free from all adhesion to the integument, and lying beneath the skin as a smooth globular tense tumour, like a foreign body, without any connections, the suspicion of its being an hydatid should be entertained; for I have already shown how the more common cutaneous tumours, such as the sebaceous and fatty, are always more or less adherent to the skin itself. The hydatid tumour is, therefore, marked more by the absence of such symptoms

as belong to the more common tumours than by the presence of special local characteristics peculiar to itself.

These tumours have no cyst walls, they are simply cysts lying in the cellular tissue of a part, which becomes more or less condensed according to the amount of pressure it has sustained and the time the parent cyst has existed in the part. They are, therefore, readily removed; a simple incision through the parts covering them in, allowing of their escape, and, as they never form any adhesions with the neighbouring tumours, no dissection is required. When suppuration exists it occurs in the cellular tissue around the cyst and not in the cyst itself; and only when this entozoon loses its life, this being one of the means adopted by nature to get rid of a foreign body which, by its death, is a source of irritation. I possess the records of some interesting cases of this form of tumour; the following notices of which may be read with advantage.

The first case is one which has been already recorded by my colleague, Mr. Birkett.

CASE 1.—*Hydatid beneath the integument on the thorax.*—A healthy woman, æt. 23, was admitted into Guy's Hospital, under Mr. Birkett's care, in November, 1853, with a small, indurated, globular, fluctuating swelling beneath the skin, situated below the left clavicle. It was quite free from all adhesion, and could be rolled, with ease, beneath the integument. It had been detected six months. When left alone it was quite painless, but, on pressure, a sharp lancinating pain was produced, which shot up to the shoulder.

A single incision was made over the centre of the tumour and the cyst removed, with the condensed cellular tissue and fat in which it had been developed. The cyst was made up of a single globular entozoon, known as the *Cysticercus cellulosus*. The wound rapidly healed.

CASE 2.—*Hydatid in the tongue.*—The second case occurred in the practice of Mr. Cock, in March, 1853; it was also in a woman, æt. 36. The cyst was situated in the left side of the tongue. It appeared as a tense, stony, and projecting tumour. It was removed by a simple incision, and proved to be a single cyst. Recovery followed rapidly.

CASE 3.—*Hydatid in the thigh, beneath the flexor muscles.*—A woman, æt. 24, was admitted into Guy's, in November, 1858, under the care of Mr. Cock, with a tumour beneath the flexor muscles of the left thigh, of two years' growth. The tumour was hard and tense, the integument over it being uninvolved. The patient was also free from pain. A single incision was made over its most prominent point, and on the deep fasciæ being divided a perfect hydatid cyst turned out, together with several smaller ones. The wound healed kindly.

CASE 4.—*Hydatid tumour over left gluteus muscle.*—A woman, æt. 22, was admitted under the care of Mr. Cock, in April, 1856. Two years previously she first detected a small lump, like a marble, beneath the integument on the left buttock; it was quite painless and moveable, and she sought advice simply on account of its growth, which had been very gradual. On the tumour being tapped, five ounces of a thin, and milky fluid were drawn off; but as it rapidly refilled, a free incision was made into it on the fifth day, and many hydatid cysts escaped. Recovery was complete.

CASE 5.—*Hydatid tumour on the left buttock.*—A man, æt. 37, was admitted into Guy's in January, 1859, under the care of Mr. Cock, with a tumour on the left buttock. It had been gradually growing for thirteen years, was painless, hard, and globular, the size of a fist, and situated beneath the integument, which was uninvolved. An incision was made into it, and an hydatid cyst removed; recovery following.

There was another example, also, of hydatid tumour on the same part, treated in the same way.

CASE 6.—*Hydatid tumour between adductor muscles of thigh.*—A man, æt. 36, was admitted into Guy's Hospital, under my care, in June, 1862, with a large tumour beneath the adductor muscles of the left thigh. He had observed it for only five months, and its growth had been gradual; it was firm, tense, and semi-fluctuating, and the integument over it was quite free. The man's health was very good, and the thigh free from pain. I explored the tumour with a trocar and canula, and drew off some milky semi-purulent fluid, and,

upon increasing the incision, nearly a pint of fluid with hydatid cysts escaped. The wound healed very rapidly, and convalescence was established.

CHAPTER LIII.

ON THE FIBRO-CELLULAR, FIBRO-PLASTIC, AND FIBROUS TUMOURS.

IN surgical language it does not appear to be an unscientific nor incorrect arrangement to place the fibro-cellular, fibro-plastic, and fibrous tumours in one group, for pathological investigations lead us to believe that these are all modifications of the same thing, being composed of fibre tissue in one or other of the forms of its normal development. In the *fibro-cellular* tumour the fibre tissue is of a delicate nature, far from compact in its arrangement, containing within its meshes serum, or a clear fluid of a more tenacious character, and in some cases nucleated cells, and appears to be made up of rudimentary or embryonic fibres, such as naturally exist in the formation of the foetal fibre tissues. To the eye such a tumour appears soft and succulent, although it will be found strong and tough on making any attempt to tear it. In the *fibro-plastic* tumour the same elements exist as have been described in the last variety. Fibre tissues form the principal basis of its structure, but this fibre tissue is of a more perfect and developed kind, the fibres being stronger in their individual nature, and their filaments bound together in larger bundles; it is therefore firmer in its substance and less succulent; its fluid is also clear and translucent, and nucleated cells are found in different quantities within the meshes of the filaments, these nucleated cells being caudate and elongated, and in different stages of their development into fibrous tissue. This form of tumour is therefore more firm and solid than the fibro-cellular, but is less so than the next variety, to which attention will be drawn, viz., the fibrous.

The *fibrous* tumour is made up of fibre tissue, and unlike

the fibro-cellular tumour, which is composed of rudimentary or embryonic fibres, and the fibro-plastic, which is made up of fibre tissue in the process of development; the fibres consist entirely of well developed and perfected fibre tissue, few if any nucleated cells entering into its formation. It is therefore of a firm, solid, or so-called fibrous fleshy feel, and is in its nature so characteristic as to forbid an error in its diagnosis. Between these three different forms of fibrous or fibroid tumours there are practically found many varieties, some containing more fibre tissue and others more of the cell element. When this latter predominates, the "fibro-nucleated tumour" is said to exist, but this variety is evidently only one of those I have already described, yet, containing more of the cell element, it approaches more closely the nature of the cancerous tumour.

What are the conditions, it may be asked, which determine the development of one or other of these forms? and if it is impossible to give an adequate answer to such a question, it certainly does appear as if the position of the part in which the tumour is developed has a material effect in influencing this point. For the fibro-cellular, a soft and succulent tumour, is, as a rule, situated in such parts of the body as are naturally made up of loose and uncondensed cellular tissue, and in which serum naturally exists; the labia in the female, and the scrotum in the male, being its most frequent seat, and the subcutaneous tissue the true position for its development.

The fibro-plastic tumour may spring from any part, being generally, however, subcutaneous, and more frequently connected with fascia and the intermuscular cellular tissue; it appears, in short, more in those parts of the body in which the developed fibre tissue is naturally present. The most genuine fibrous tumour is found in the uterus, this part of the body containing more perfect and abundant fibre element than any other, but surgically the skin and periosteum are its most frequent seats, these parts containing also abundant fibre tissue. All these growths are, however, absolutely local; they affect the health of the patient simply from local causes, and never attack the body through the lymphatic system, the absorbent glands in no recorded cases having become involved. This point is a very valuable one, stamping these

fibroid tumours as essentially distinct from the cancerous or malignant.

Analysis of Cases.

I possess the records of fifteen cases of the fibro-cellular tumour, and all were connected with the female genital organs, one or other of the labia and nymphæ being involved. In every example excision was performed, and with success. The cases are hardly of sufficient interest for quotation. They almost all appeared in young women, and were of slow growth, several being of twelve or fourteen years' existence. In no one instance was any pain present, the mechanical inconvenience connected with the tumour being the chief reason for its removal.

Diagnosis.—The fibro-cellular are purely cutaneous tumours, being situated, as already explained, in the cellular tissue of the skin and formed by the unnatural growth of such a texture; they are intimately connected therefore with the integument, and to the hand appear as if the skin and its subcutaneous tissue were infiltrated with a more solid material. It is a kind of solid œdema of a part, yielding a fleshy feel, is in some cases more solid than in others, and in certain examples appears as a kind of polypoid growth. The polypi of the nose and of the neck of the uterus, and many of the tumours connected with the antrum, are made up of this fibro-cellular tissue, but these are of a peculiar succulent kind. The tumours of the integuments are more solid, but of the same nature. The pedunculated tumours of the skin are of the same description. In an example of this affection which I removed from a man aged twenty-six, the tumour was so full of serum that, when removed, it collapsed into a very small compass: it was pedunculated, and of congenital formation. The pedunculated or polypoid cutaneous fibro-cellular tumours are by no means uncommon; they grow at times to a large size, are as a rule perfectly painless, and prove of inconvenience simply from their dimensions; they may be readily removed, and in some cases a simple twist of their pedicle is enough to cause obstruction to their circulation, and the subsequent sloughing of the growth. I have removed many such

growths by these means in patients who have rejected the more surgical method, having accidentally hit upon the plan some years ago from seeing a tumour turn black during its manipulation for examination; one half turn of its pedicle, as a rule, suffices to secure this end, but if not, a more perfect twist may be made, the tumour being subsequently fixed in this position by strapping. In the Guy's Museum a large tumour may be seen, which I removed by this method.

The *diagnosis* of the fibro-plastic tumour is not always a subject of difficulty. It is found always as a distinct growth, and never as an infiltrating one, increases by a gradual process, separating the tissues between which it is situated, and is not generally painful, pain being, as it were, an accidental complication, depending upon the situation of the tumour relatively to the nerve trunks, and upon the fact of its being bound down and confined by any dense structure, as a fascia; in which cases the pain may be intense, and relief is only gained on the removal of the cause. These tumours have an irregular outline; they are not uniform in their shape, like the cystic tumours, but have a more botryoidal character, being more or less nodular; and when bound down by a fascia their external characters are necessarily lost. The tumour then feels firm and fleshy, but its diagnosis rests more under these circumstances on other points, such as the age of the patient, rapidity of the tumour's growth, and the presence or not of any secondary glandular affection.

These fibro-plastic tumours may grow at all ages, but as a rule they attack the young and middle aged: of the eighteen cases I possess, seventeen commenced in patients under the age of forty, the majority of cases beginning in subjects between twenty and thirty years of age.

3	were developing	only a few months.
5	„	between 1 and 5 years.
4	„	„ 6 „ 10 „
6	„	over 10 years. Two of them growing 25 years.

They seem to be as common in the male as in the female sex, and no assigned causes for their appearance can generally be fixed upon. They turn out, as a rule, readily from their attachments, upon making a clean incision of the parts covering

them in; and recovery rapidly follows. In all the cases recorded a good result ensued.

The neck and the region of the parotid gland is a very frequent position in which these tumours are found; they sometimes grow superficially, but at others in the deeper structures; and, when growing in the parotid region, it is almost an impossibility to make out, with anything like accuracy, their true connections, an apparently superficial tumour having often very deep attachments; they are never accompanied with any secondary glandular enlargement.

The Diagnosis of the Fibrous Tumour.

Fibrous tumours are seldom found as isolated growths, like the fibro-plastic; although, like them, they are commonly associated with those tissues into the composition of which the fibre element enters largely. The best examples are found in the uterus and prostate gland, but the cases which come under the notice of the surgeon as tumours the most frequently, are developed in the skin, or in the fasciæ and tendinous structures connected with bone.

I have the notes of ten examples of so-called fibrous tumours, seven of which were developed in the integument and three beneath it, near the bone, these three being connected with the hand. The fibrous tumours more intimately associated with the osseous system will be considered with the tumours of bone. There is not, usually, any difficulty in the diagnosis of these cases, for the tumours are hard and fibrous to the touch, and, as a rule, painless; they are also slow in their growth, and are unconnected with any secondary formations. Their excision is the general practice.

The following brief notes of some of the examples of fibro-plastic and fibrous tumours may be read with interest.

CASE 1.—*Fibro-plastic tumour over right parotid.*—Sarah P—, æt. 35, was admitted into Guy's, under my care, in March, 1863, with a tumour, the size of a small orange, over the right parotid, of a botryoidal outline. It was unconnected with the integument, painless, and appeared moveable; it had been growing for fifteen years. It was readily excised, and convalescence followed.

CASE 2.—*Fibro-plastic tumour over parotid.*—Mary S—, æt. 41, was admitted into Guy's Hospital, under the care of Mr. Birkett, in May, 1856, with a large, lobulated tumour, the size of a cocoa-nut, over the right parotid region, of twelve years' growth. It was unattended with much pain, or with any paralysis of the facial muscles. It was excised, and recovery followed.

CASE 3.—*Fibro-plastic tumour over left parotid region; paralysis of facial nerve.*—A man, æt. 52, was admitted, in November, 1856, into Guy's Hospital, under the care of Mr. Coek, with a tumour, the size of a fist, over the left parotid, of twenty-five years' growth, and with paralysis of the facial nerve of three months' standing. The tumour was excised and convalescence ensued, the paralysis of the facial nerve disappearing.

CASE 4.—*Fibro-plastic tumour in right parotid.*—A woman, æt. 29, was admitted into Guy's, under the care of Mr. Coek, with a tumour in the right parotid of eleven years' growth. It was excised, and the tumour turned out of its cyst, which reached deeply down to the vertebra, the carotid vessels lying in front of the tumour. A good result followed.

CASE 5.—*Large fibro-plastic tumour behind left shoulder; excision; recovery.*—A man, æt. 41, was admitted into Guy's, under my care, in April, 1863, with a large tumour, the size of half a cocoa-nut, projecting apparently from behind the deltoid muscle; it had been observed only seven months, although pain had been felt in the part many months previously, but when the tumour appeared externally the pain diminished. His axillary glands were not to be felt, but he had a large glandular tumour beneath the jaw, of ten years' growth. His health was good. The integument was uninvolved, and the tumour had a firm, fleshy feel, and somewhat irregular outline, several bosses projecting in different parts. The tumour was removed by making a vertical incision through the integument covering it in, and was then found to have been developed beneath the deltoid muscle; it turned out with some facility from its bed. Having removed the parent tumour, two sepa-

rate and distinct growths were then detected—one small, the size of a large marble, imbedded in the body of the deltoid muscle; and the second, about the size of a walnut, lying between the fibres of the *teres major*; these were readily removed, and a good recovery followed. No return has taken place up to this time. Microscopically, the growth was seen to be made up of the elements of the fibro-plastic tumour, the cell element largely predominating.

Remarks.—This case was one of unusual interest. First, as to its diagnosis—Was it connected with bone, or was it situated only beneath the muscles? The fact of extreme pain having long existed before the detection of the swelling led one to suspect its having an osseous origin, for this symptom is one of great value in the diagnosis of deep-seated tumours; new growths, associated with bone, being, as a rule, long preceded by a deep-seated pain. But in the case under consideration the tumour appeared moveable, and was certainly not influenced by the rotation of the humerus.

Was it a simple or a malignant tumour? was the next point demanding solution. The age of the patient, and the rapidity of its growth, pointed in a measure to its malignant nature; but the apparent good health of the man, and the absence of any secondary glandular enlargement, was in favour of its innocent character; and it must be remembered that this point is one of great value, for doubtless in acute cancers the secondary glandular enlargement is an early symptom. The skin, also, was uninvolved, and the tumour appeared isolated between the muscles—these facts pointing strongly in favour of its being of an innocent character, for cancer, it is well known, has a strong tendency to infiltrate parts, and not to separate them. Upon the whole, the facts present preponderated in favour of its being simple.

There is another point in the case which demands a notice, and that is the presence of two other independent tumours of a like nature within the muscles of the part. I know of no other case in which this fact is illustrated.

CASE 6.—*Fibro-plastic tumour in the calf of the right leg; amputation; pyæmia; death.*—A man, æt. 51, was admitted

into Guy's, on September 7th, 1857, with a large tumour, occupying the calf of the right leg, of one and a half year's growth. It had increased steadily, and was accompanied with some pain; it was tense, had a uniform outline, and evidently a deep attachment. The lymphatic glands of the limb were unaffected, but the man's health was not good, and he had a very cachectic aspect. An exploring trocar and canula were introduced, but with little result—a small piece of the tumour, however, came away within the canula; this I examined by the microscope, and found to contain the elements of the fibro-plastic tumour. Amputation was therefore performed, but the man died on the thirteenth day, from pyæmia.

The tumour had originated between the two layers of muscles, and had caused a complete wasting of the gastrocnemius, which was spread over it.

CASE 7.—*Congenital fibro-plastic tumour of the toe; amputation; recovery.*—Eliza T—, æt. 8, was admitted under my care, in October, 1863, with a congenital tumour, the size of a walnut, occupying the whole of the right little toe; it was painless, and had been growing slowly; it was excised, and found to be a good example of the fibro-plastic tumour, approaching more the fibrous nature.

This case is introduced here as a type of a class of congenital tumour which is not uncommon; I have seen and treated many such.

On the Fibro-nucleated Tumour.

I have the record of only one example of the fibro-nucleated tumour; it occurred in a female patient of Mr. Coek's, aged thirty, and was of three months' growth. When admitted into Guy's, in April, 1857, it was about the size of an orange, and was situated by the side of the umbilicus; it was evidently growing in the integument, and to the hand felt hard and fibrous; there was no secondary glandular enlargement, and the health was good. It was readily removed, and microscopically was composed of little else than simple nuclei, held together by fibre tissue.

This is the only example of this form of tumour I have had the opportunity of examining, such cases being evidently very rare. The fact of their being chiefly composed of cell element is one which undoubtedly links them to the malignant tumours, and this case will therefore lead us to consider another class of fibro-plastic tumour, which has been described by Mr. Paget as the recurring fibroid.

CHAPTER LIV.

ON THE RECURRING FIBROID TUMOUR.

THE name given to this class of cases very accurately defines their pathological peculiarities. They possess all the characters of the fibro-plastic tumour we have just described; but they possess one of the features of the cancerous, in so far as they have a constant tendency to return, after removal, either in the same place or in the neighbouring parts, even to many times. In the pathological chain of tumours they are therefore unquestionably connecting links between the innocent and malignant growths. There is really nothing very distinctive in their external character by which they can be known. They are, perhaps, somewhat less dense than the ordinary fibro-plastic tumour, and are more rapid in their growth. Microscopically, they also possess more of the cell element than the innocent form, these cells taking on the caudate shape; but I know of no means by which a definite diagnosis can be made of such a growth. The more rapid the development of a fibro-plastic tumour, and the more cellular its structure, the greater appears to be the probability of its being of this nature.

The following are the brief records of some of the cases which I possess. Three of the best examples which can be brought forward have been already published by my colleague, Mr. Birkett, in the 'Guy's Reports' for 1855, in a very interesting paper upon this subject; but as they form part of the material upon which this communication is based, they must be re-quoted here, although in a condensed form.

CASE 1.—*Recurring fibroid tumour in the thigh; seventeen operations for removal during a period of ten years; death from phlebitis.*—A girl, æt. 16, was admitted, under the care of Mr. Cock, into Guy's Hospital, in August, 1847, with a small tumour in the anterior region of the right thigh, which she had observed for one year. It was just beneath the integument, and was soft, moveable, and very painful. Her health was not considered to be very good, although she looked hearty. In December, 1847, the tumour was excised; it was soft, succulent, and vascular, and the microscope showed it to be made up of delicate fibres of fusiform nucleated cells; the wound healed in one month.

Four months after this, in May, 1848, there appeared by the side of the cicatrix a return growth, which increased slowly, and was removed in October of the same year. It had the same appearance as the last, except that here and there were small cysts, filled with soft, jelly-like material.

In April, 1849, a *third* growth made its appearance, and was exquisitely painful. It was removed in October, 1849, together with a nerve which had a ganglionic enlargement in the old cicatrix.

In November, 1850, a fourth recurring tumour had appeared, of six months' growth, and on this occasion the fascia beneath was removed with it.

Other operations were performed in March, 1852, July, 1853, and repeated up to January, 1856, when she went into St. Bartholomew's Hospital, and died from phlebitis, after which Mr. Paget forwarded to Mr. Birkett the following particulars:—"The tumour that I removed from C. S— was a large, soft mass, protruding from the middle of the scar or scars of seventeen operations performed for the extirpation of similar tumours. Portions of the tumour were imbedded in the rectus femoris and vastus internus, and it was necessary to remove part of the sheath of the femoral vessels. At the autopsy the effects of peritonitis were found (probably of pyæmic origin), but no appearance of morbid growth of any kind in any internal organ."

CASE 2.—*Recurring fibroid tumour in the thigh; three separate operations during seven years; amputation and death.*

—A woman, æt. 39, was admitted into Guy's under Mr. Cock's care in June, 1856, with a tumour in the thigh, which she had observed for five or six years before her admission. For some years it had increased slowly, but for the last fifteen months it had grown rapidly and caused pain. It was quite moveable among the soft parts, and the skin over it was uninvolved. In July, 1856, Mr. Cock enucleated the growth, which measured six inches in diameter. It was invested by a delicate fibrous envelope, was soft, succulent, semitransparent, and of a yellowish tint. Microscopically, the elements were those of the fibro-plastic tumour. The wound healed, but a tumour again appeared, and in December was removed. A third growth made its appearance with extreme rapidity; and by August, 1857, reached from the hip to the knee; it was very pendulous, and in its greatest circumference measured forty-two inches. In August, 1859, Mr. Cock amputated the leg above the knee. The mass weighed several pounds, and was composed of large lobes of soft, succulent, yellowish tissue, loosely held together by connective tissue. A fibrous texture was observable in some of the lobes. It grew entirely in the soft parts of the limb, the bone being quite healthy. Some of the lobes were sloughing, and a large one had ulcerated through the integuments. The elements of these growths were fibro-plastic.

The patient sank from exhaustion, but there was no post-mortem examination; the lymphatic system appeared free from disease, and there was no reason to suppose that any new growths were developed in the viscera. A model of this growth, made by Mr. Towne, may be seen in the museum of Guy's.

CASE 3.—*Recurring fibroid tumour in the leg; four operations in eight years; amputation; death.*—E. C—, a healthy woman, æt. 41, was admitted under the care of Mr. Birkett, in March, 1853, with a small tumour, of six years' growth, in the anterior portion of the leg. It was hard, about two inches in diameter, and appeared to be firmly fixed to the fascia, but the integuments were free, and the lymphatic system was unaffected. The tumour was removed, and the wound healed, the growth presenting all the microscopical features of

the fibro-plastic tumour. At the end of July in the same year a second growth was developed near the cicatrix ; in four months it became as large as the first, and was then excised.

In March, 1854, three or four independent nodules were again to be felt; these grew rapidly, and were removed in April, 1854. New growths appeared after this operation before perfect cicatrization had taken place, and their increase was very rapid, so that in six weeks a large mass of disease existed which had made its way through the integument of the limb, discharging a thin, inoffensive ichor; its surface was lobed and irregular, and to the hand appeared firm. It occupied the entire upper third of the leg, and could be treated only by amputation; this was performed in July, 1854, and the stump healed. About one month after the amputation, however, a slight induration was detected at the spot over which the pad of the tourniquet had been placed at the time of the operation, and after two weeks it became evident that a returned growth had made its appearance. This increased, causing intense suffering, and in seven months had reached an enormous size, the diseased limb measuring seventeen and a half inches more than its fellow.

In March, 1855, the lower mass had sloughed, and this was followed by hæmorrhage so profuse as to cause the patient's death.

Necropsy.—The examination was made by Dr. Wilks forty-eight hours after death. No signs of decomposition existed externally; no rigor mortis. The body generally was greatly emaciated. The lungs and heart were free from disease. The alimentary canal was healthy, the liver white, and containing much fat. Spleen soft, and the corpuscles very large. Urinary and genital organs were quite healthy. None of the glands of the lymphatic system in any part of the body were diseased.

The diseased thigh.—The whole of the thigh, from the groin to the stump, formed a large mass, divided into two by a transverse depression. The upper and the larger formed a large, round, and hard tumour; the lower was soft and filled with blood, which, penetrating the skin, produced a clot protruding on the surface. Thus the traces of the two separate growths, which had originally existed, still remained. The

upper tumour could be easily turned out, the integument being in no way involved, and readily peeling off. Neither the muscles nor the femur were attached to it. The muscles surrounding it, although pale, were not at all affected by the disease, and the bone was healthy. The femoral artery and vein ran through the growth, and were quite perfect; they traversed it at about the junction of the upper two thirds with the lower third of the tumour. The facility with which it could be enucleated was due in great measure to the serum which everywhere surrounded it. Although the tumour was perfectly defined, it was not enclosed in a true cyst, but the hardened and dense morbid tissue formed a tolerably firm, fibrous envelope around it; in shape it was nearly round. A section displayed a somewhat soft substance, which was, however, tough and tenacious, so that a piece of it could not be squeezed out of its original shape into a pulsatous or diffuent mass, after the manner of medullary cancer. It had a firm and leathery consistence, and contained serous fluid. About half the growth was decaying or dead; all the central part was in shreds, and contained small cavities filled with yellow serum. This necrosed part was of a pinkish-yellow colour.

The circumference of the tumour was of a pale, milk-white colour. Between this large tumour and the end of the stump was a similar morbid growth, of less size and less defined; it was rapidly decaying, and was filled with a large quantity of the fibrine of the blood. The large tumour weighed eight and a half pounds. The microscope exhibited a very uniform structure of nucleated fibres and fibro-plastic elements. The only resemblance to the elements of cancer was, that in some of the cells the nuclei were of a very large size.

These three examples of the disease I am now describing are so typical of their class that I feel it would be useless to quote any other less well-marked cases which I possess. It was my good fortune to have observed from their first admission into Guy's the cases which I have been tempted to reprint, and I think any one with moderate powers of observation who had the chance of watching the progress of the development of such a recurring fibroid tumour as existed in any one of these illustrations, would find no difficulty in diagnosing such a case from

a cancerous or malignant growth ; for even without any minute or microscopical examination of the tumour these cases present general features which are tolerably characteristic. It must be observed that these tumours, as a rule, attack the young and healthy ; they grow from a fascia or aponeurosis, are of slow growth, particularly at first, and destroy life only after many years, and from local causes. They return only either in the spot from which they originally sprang, or from its immediate neighbourhood. They affect the part simply, mechanically, by separating and surrounding tissues, but never by infiltrating them ; the skin is only mechanically stretched over the tumour, but never involved in it ; and if destroyed it is simply by ulceration from over-distension, while the absorbent glands are never secondarily involved, even in extreme conditions. Such tumours are to the hand more or less fibrous, and lobulated, their fibrous feel being much influenced by their rapidity of growth. When cut into they present a more or less compact surface, a clear serous fluid infiltrating its meshes ; and even the finest microscopical section will be found tough and tenacious, and incapable of being pressed into a diffuent mass. Under the microscope they present the characters of the fibro-plastic tumour, although with an excess of nucleated cells and nucleated fibres, this, again, showing their tendency towards the characters of the malignant growth.

CHAPTER LV.

ON CANCEROUS TUMOURS.

SECTION I.

ON EPITHELIOMA, OR EPITHELIAL CANCER.

IN the last section a class of tumours has been briefly illustrated, evidently forming a connecting link between the innocent and so-called malignant growths ; for it has been shown that they are not so innocent as not to return after their

removal, and not so malignant as to repeat themselves in the internal organs, nor to affect the body through the lymphatics, nor infiltrate the parts with which they come in contact. In the class of tumours we are now about to consider, it will be seen that a further and more advanced step is taken towards malignancy, for these epithelial tumours have both a tendency to return in a part after their removal, and to affect the system through the lymphatics. In rare cases, also, they may be found in the internal organs. These tumours, however, always affect the skin or mucous membrane, and never originate in any other tissue, but they possess this feature in common with the more malignant cancers, that they have a constant tendency to infiltrate the parts with which they come in contact, and do not, as has been already shown with the innocent tumours, simply separate them. They are the common forms of cancers found in the lip, tongue, œsophagus, vulva, clitoris, penis, and rectum; and may be described as the cancer of the skin.

It is not my intention, in these pages, to consider the subjects of cancer of the lips, tongue, or rectum, for they have been already discussed in former pages, nor of cancer of the female genitals and penis, which may be illustrated at another time; in my present communication I would treat rather of the external or cutaneous tumours, and I have the records of twenty-two examples, including cancers of the integument of the head, face, sternum, and extremities. They all occurred in male subjects, and at a late period of life. They were all of slow growth; in some cases many years had passed before advice was sought; and, in all, the general health of the patient was good.

Epithelial cancer is essentially an infiltrating disease; it is not, as the sebaceous and fatty, fibro-plastic and fibrous tumours, a distinct growth developed in the tissues and separating them, but it is, from its very beginning, an infiltration. It begins, as a rule, as a little wart or tubercle, and this gradually spreads; it may crack, fissure, or ulcerate, and when this latter stage has been arrived at, the careful examiner will at once observe its true character, for the integument forming its margin will be evidently infiltrated with the cancerous material, and will present the well-known indurated and everted edges, these appearances forming a marked contrast to the con-

dition of integument which has been ulcerated or ruptured by over-distension in a simple or innocent growth, for these edges are never thickened, or infiltrated with any new matter, unless it be with inflammatory products. As a local disease, this epithelioma may slowly progress for years, and cause little pain, inconvenience, or injurious influence. Five, six, eight, or fifteen years have passed away in some of the cases before me, ere advice was sought; and it may, indeed, continue for many years, and never affect the patient more than as a local disease.

CASE 1.—*Epithelioma of outer canthus of eye; excision.*—A sweep, æt. 41, was admitted, March, 1860, with an epithelial cancer at the outer canthus of the eye, of eight years' growth. His health was good, and no glandular affection existed. It was excised by Mr. Poland, and recovery ensued.

CASE 2.—*Epithelioma of cheek; treated by caustics; recovery.*—A fisherman, æt. 70, was admitted into Guy's, under Mr. Cock, in April, 1863, with a large cancer of the cheek, the size of a crown, and of six months' growth, the edges being very raised, thickened, and everted. It was destroyed by the frequent application of a paste composed of equal parts of chloride of zinc and plaster of Paris. The man left cured.

CASE 3.—*Epithelioma of the dorsum of the hand; old cancer of the lip, six years previously; indurated axillary glands.*—A man, æt. 66, was admitted, in February, 1859, with an extensive cancer on the dorsum of the hand, of four years' growth, and secondary enlargement of the axillary glands, of two months' standing. He had had a cancer removed from his lip six years previously, and no return had taken place. He left without any treatment.

CASE 4.—*Epithelioma of dorsum of hand; amputation; recovery.*—A healthy man, æt. 69, was admitted by Mr. Cock, in November, 1856, with an extensive cancerous affection of the dorsum of the left hand, but with no other sign of disease. Amputation of the hand was performed, and good recovery followed, the stump healing by primary union.

CASE 5.—*Epithelioma of heel, involving os calcis; amputation and recovery.*—A healthy man, æt. 36, was admitted into Guy's, under my care, in July, 1858, with an extensive ulceration of the heel and side of the foot, accompanied with disease of the os calcis, the whole bone being excavated and involved. The disease had existed twenty years, having gradually become worse after an injury he sustained at that time. The lymphatic glands of the limb were quite sound.

Nothing but amputation could be entertained. This was accordingly carried out, and a good recovery followed.

On examining the part, a most beautiful specimen of epithelial cancer was to be observed. It had evidently commenced in the soft tissues, and passed deeply down into the bone, for its cancellated tissue was infiltrated and filled with the epithelial cells, characteristic of this structure; indeed, I have never witnessed a more perfect microscopical specimen of epithelial disease; and may add that, when this affection attacks bone, the same condition may be always observed.

In the cases I have already given, examples of epithelioma, as a simple local disease, have been quoted, as being treated successfully by excision or the application of a caustic, and others in which the severer measure of amputation was considered requisite. Illustrations have also been related of this epithelial disease affecting the system through the lymphatics; and in one case it had passed from the skin or tissue, in which it had originally commenced, and by its infiltrating powers had produced extensive disease of the bone beneath.

In the two following examples, another of its features is well shown, viz., its tendency to return in the part in which it originally grew, for in both these cases an apparent cure had been effected on many occasions, only to be followed, however, by an early return of the disease.

Both these cases have been under the care of Mr. Birkett, but I have had abundant opportunities of watching the progress of the affection.

CASE 6.—*Epithelioma of the integument over the sternum; numberless operations and apparent recoveries; return of the disease.*—J. M—, a remarkably healthy man, æt. 50, came

under my notice with epithelioma of the integument of the upper portion of the sternum, in October, 1853, having been a patient of Mr. Birkett's for some years; and he was then admitted under that gentleman's care into Guy's Hospital. He had a cancerous ulcer over the sternum, about the size of a crown.

The disease had first appeared nine years previously as a wart, and three years before his admission, when it had reached about the size of a florin, Mr. Birkett excised it, the wound healing in three weeks. He remained well for two years, when the present growth appeared, and on this occasion it was again excised, with the same result. The disease again reappeared, to be again removed, and from that time up to the present year this alternate cure and fresh eruption of disease has been going on, and for years past the destruction of the cancer has been readily obtained by the chloride of zinc paste.

The man's health is still good, and no indication of secondary glandular affections are to be detected, but the cancer always re-appears after its removal.

CASE 7.—The next case is precisely of the same character as the one already quoted, and also occurred in a patient of Mr. Birkett. Dennis C—, æt. 50, was admitted into Guy's, in November, 1857, with an extensive cancerous ulceration of the integument on the upper portion of the sternum and lower portion of the neck, having existed for three years. The application of Burnett's solution of chloride of zinc, in the concentrated form, caused its removal and cicatrization, and for two years he remained well, but in 1860 he again returned with the disease as bad as ever,—it was again destroyed by chloride of zinc, used as a paste, with the same result, and for the last ten years he has been quite well. The man's health was still good, and the lymphatic glands unaffected.

SECTION II.

ON CANCEROUS TUMOURS.

What is a cancerous tumour, of what is it composed, and how is it to be recognised? are three questions which the student is constantly asking—and I imagine there are few ques-

tions which are more difficult to answer with any accuracy, or satisfaction to the inquiring mind.

Pathologically, a cancerous tumour is not composed of any definite or characteristic elements, such as at once stamp it as being a cancer; it does not contain any distinct cancer cells which mark its nature, for the cells, nuclei, and fibres, which enter into the formation of a cancer may all be traced in other and in innocent morbid growths. It does not appear, however, to be incorrect to assert that the more the cell element predominates in a growth the greater is the probability of its being malignant, and therefore cancerous; for the soft cancers, which are undoubtedly the most virulent, are made up almost entirely of cells and nuclei—only enough fibre tissue existing to bind and hold these cells together.

It has been already shown how the so-called innocent tumour approaches the malignant in some of its features; and it will have been observed that those which form the intermediate links between the innocent and malignant, structurally approach the latter, in having more of the cell element in their composition; the fibro-nucleated and recurring fibroid tumour existing as proofs.

But these points touch only the anatomy of those growths, and not their symptoms; they do not assist the surgeon to make out before its removal whether the tumour before him be a cancer or not.

What, then, are the external and general symptoms by which this point can be determined?

If a tumour is found in a part, infiltrating the tissues with which it is in contact, there can be little if any doubt as to its being a cancer, for no innocent growth infiltrates a tissue—it simply separates them. This question of infiltration of a part, or merely separation, is most important, and is, doubtless, one of the most valuable means we possess for the purposes of a correct diagnosis.

A cancerous tumour does not, however, always infiltrate a part, although an infiltrating tumour is almost always a cancerous one; for it may appear as a distinct and isolated growth, being then, in surgical language, described as tubercous. What, then, are the symptoms by which a tubercous cancer may be known? And first of all, has the tumour itself any peculiari-

ties by which its nature may be recognised? Unfortunately, a negative answer must be given to this question, for although it may not be an unfair thing to suspect the presence of a cancer when the tumour does not present any of the special appearances or symptoms which commonly characterise the innocent growths, it can only be a suspicion, as many innocent tumours are often deficient in the special symptoms, which, when present, readily attest their true nature.

A subcutaneous tumour, unconnected with the integument, with an irregular bossy outline, and of a firm, fibrous feel, will, in all probability, be a simple tumour, for these are not the characters of a malignant one; but a tumour with a smooth uniform external surface may be from these symptoms alone either a simple or malignant growth. We must, therefore, look to other than local, although concomitant symptoms, to aid us in a diagnosis. I have already alluded to the tendency which the malignant tumour possesses to involve the tissues in its neighbourhood, and have remarked that this tendency does not belong to the innocent growths; if, therefore, any adhesion or drawing in of the integument to the surface of the growth can be detected, the suspicion of its being a cancer may be entertained.

But we will now pass on to another symptom, which, if present, is most characteristic of the cancer; and that is, a secondary glandular, lymphatic enlargement; for if this symptom is present with a doubtful tumour, the probabilities of its being cancerous become very strong, for I have already stated that the innocent and non-malignant tumours are rarely, if ever, attended with enlarged lymphatic glands.

A distinct and isolated tumour, therefore, which does not possess any of the special characters of a simple growth; which is attended with some evidence of secondary affection or infiltration of the parts, and with which an enlargement of the lymphatic glands in its neighbourhood exists, may safely be regarded as cancerous. It is, however, only in the early stages of the development of a tumour that a difficulty in diagnosis is usually felt, for in the long-standing and well-developed growth the diagnosis, as a rule, is not difficult.

The soft, and so-called medullary cancer, is the form which is usually met with during young life; it makes its appearance

generally suddenly, and often after the receipt of some blow or injury; it grows very rapidly, and presents a surface which is, as a rule, smooth and uniform, or of a semi-solid and fluctuating feel, and with large full veins wandering across. It is known by its sudden appearance, rapid growth, and uniform surface, these points being very different to those which simple tumours present, these innocent growths being generally slow in their development, and more marked in their outline. The cases of medullary or soft cancer run their course very rapidly, and destroy life within a very short period of their development.

The hard cancers are the affections of middle age and adult life. They grow more rapidly than the innocent growths, seldom requiring more than a few months to establish their true nature; they seldom put on the external appearances of a simple tumour, and never exist long without assuming features which are more specially characteristic of cancer, the implication of neighbouring tissues and secondary glandular enlargements being the chief points.

It is hardly necessary to quote cases of cancer to illustrate these remarks. Out of the 39 examples I possess of cancerous tumours not affecting any special organ (for the cancer of the breast, testicle, and bones will be considered with the tumours of those parts on another occasion), 14 of these cases are examples of intermuscular cancer; 4 of the parotid; 13 of the lymphatic glands; 5 subcutaneous; and 1 of the tonsil. But a further analysis of these materials must be postponed, as it is my intention to take the cases of cancer as a whole, for the purpose of analysis, after I have considered the cancers of the special glands and parts.

On Melanotic Cancers.

If it were necessary to adduce a forcible illustration of a pathological fact which is now pretty generally accepted by pathologists, the development of melanotic cancers might be made of great value; for the natural history of both these primary and secondary melanotic growths proves that a cancer when first developed in a part, in a measure partakes of the nature and peculiarities of that part, and even when repeating itself in the lymphatic glands and internal organs, still pre-

serves the characters which it originally acquired from the seat of its primary development. This pathological truth, as has been already shown, is as applicable to innocent growths as to other cancers, but the natural history of the melanotic form is perhaps the strongest argument in its favour. A melanotic cancer always grows from a part which naturally contains pigment, and a mole is unquestionably its commonest seat. It may be, perhaps, that the secondary glandular enlargements, in their rapidity of growth, outstrip the tumour from which they originally imbibed their peculiar nature; nevertheless their true character is maintained and preserved unto the end. The soft or medullary cancer is the form with which the pigment is invariably associated, and I know of no exception to this fact. This cancer, as a rule, runs a very rapid course; an extreme example of melanotic cancer being typical of the worst form of the other varieties.

I possess the records of seven very interesting examples of these melanotic cancers, and shall therefore quote the brief notes of some of the most characteristic.

CASE 1.—Mary R—, æt. 30, a married woman, was admitted under my care, into Guy's Hospital, on April 3rd, 1854; she was a healthy-looking woman, with a dark complexion, and from birth had had a mole on the front part of her right leg. It had never grown, however, or caused any inconvenience, till two years previously, when it began to enlarge, and after eight months' growth was excised. The wound had hardly healed when other growths in the same locality made their appearance, and from that date they multiplied very rapidly. On admission, the whole of the anterior portion of the leg was studded with melanotic cancers; some were as small as millet seeds, and lying beneath the skin; others, of larger dimensions, were infiltrating the integument; some were unbroken, and others, again, had softened down, leaving open cancers. The inguinal glands were also enlarged. Under these circumstances nothing by way of operation could be done, and she therefore left the hospital unrelieved.

A model of this limb may be seen in the Guy's Museum.

CASE 2.—Thomas G—, æt. 30, a potter, was admitted into

Guy's, under my care, in January, 1863. It happened that, two years previously, a mole, which had existed from birth over the ensiform cartilage, began to enlarge, and about the same period a tumour made its appearance at the margin of the axilla. He applied for advice at a large hospital, where the mole was removed, and, as a return growth immediately appeared, a second operation was carried out, in May, 1862, two months after the first. From this time the axillary tumour gradually enlarged, and on admission it was about the size of an orange; other tumours also appeared, and these, when coming under observation, were studded all over the abdominal walls. When admitted, the man was extremely pale and cachectic; his pulse was very weak, and his powers were failing. Tonics, good living, and wine were freely given, without advantage, the tumours rapidly increasing and fresh ones making their appearance. In a few weeks a dry cough set in, followed in a short time by pneumonic expectoration, and from this time he gradually sank, without any other definite symptom, dying on March 14th, 1863. It may be added, that he had no head symptoms.

Autopsy, by Dr. Wilks.—A number of nodules were on the body, consisting of soft cancer containing pigment, none being absolutely black. On removing the *brain*, fluctuation was felt in the left hemisphere towards the median line, and on cutting it through, a very loose growth was found, about the size of a walnut, consisting of a distinct vascular wall for outline, and within very little more than a few threads passing across it, and within these some serum. When this flowed out, almost a complete cavity was formed. It thus appeared, at first, to be nothing more than an inflamed cyst, but there was sufficient structure in the adventitious material on the walls to show its cancerous nature, and its resemblance to the other growths in the body; there was, apparently, however, no pigment. The *lungs* were full of tumours; probably about half of each was thus occupied, many of them were very large, as large as an egg. When cut, they were found mostly of a brownish hue of different degrees of intensity and shade, some almost white, others brown from the presence of pigment. The bronchial and mediastinal glands were similarly affected. The *heart* had on its front surface, and imbedded in the walls of the right

ventricle, a tumour the size of a marble, which was also cancerous, and contained a small amount of pigment. The *liver* was full of pigmental cancer, the tubercles being smaller than those in the lung, and situated more upon the surface of the organ. The *spleen* contained also two masses. The *lumbar* glands were also diseased, and contained much pigment, as also were the *mesenteric*. There were also a few growths in the *pelvis*, and one black nodule growing from the anterior wall of the mucous membrane of the *bladder*. There was no disease in the kidneys.

CHAPTER LVI.

ON THE CARTILAGINOUS TUMOUR, OR ENCHONDROMA.

It is well known that the largest proportion of the cartilaginous tumours which are met with in practice are connected with bone, but these cases will have to be considered with the tumours of that structure. On the present occasion it is proposed to confine our remarks to the independent cartilaginous tumours, such as are most frequently found in the region of the jaw, but which may be developed in other parts. It is unquestionably true, however, that a large proportion of the innocent tumours developed in the neighbourhood of the parotid or submaxillary gland contain cartilage as a part of their structure, although the causes of such a connection are completely hidden from our knowledge. But it is not to these that the present pages will be devoted, for cartilage forms the chief structure of the tumours which we are now considering.

I possess the records of 12 examples of the enchondromatous tumours; 11 of these were developed in the region of the jaw, and 1 on the leg as an independent intermuscular tumour. Of the 11 developed in the neighbourhood of the jaw, 9 were situated in the parotid and 2 in the submaxillary glands. All were excised, and with success. These tumours, as a rule, appear in young subjects and in people under middle age; in only one example out of the twelve did the disease appear after thirty years of age, seven cases first developing before the age of

twenty; and, curiously enough, only two of the cases occurred in male subjects. I am not aware whether this greater tendency of females to the development of such growths is general, but the fact, as already stated, seems worthy of record. These tumours are also slow of growth; the shortest period noted in these examples before me was one and a half years, but three, four, six, twelve, and fourteen years, appear to be the usual time before they attain a sufficient size to make the patient seek advice. In none of the parotid tumours was there any affection of the faeial nerve, and this point is one of value for diagnosis, for in the majority of simple tumours developed in this region the nerve is not involved; although there are exceptions to this rule, one of which I have quoted amongst the fibro-plastic tumours. But it must be added, that in the cancerous tumours which generally infiltrate the parotid, the nerve is almost always implicated, the exception existing when it is left free. These tumours are always encysted, and have a smooth, tense, and elastic feel; in some examples they are uniform and even, in others they are bossy and nodulated; they rarely cause any pain, and produce anxiety simply from their position and size. They, as a rule, appear to grow superficially to the parotid or submaxillary gland, but often dip down deeply into these structures, and require considerable care, therefore, in their removal. They are often, also, very adherent to the parts around. They are simple tumours, and consequently only separate the parts between which they are developed, never involve the integument, but only stretch it, and do not affect the system through the glands, although it must be added that rare examples are on record in which cartilaginous tumours have returned, and have affected the lymphatic system like a cancer. Their removal by excision is the only correct treatment, and a vertical incision is the best when the parotid region is the seat of the disease, so directing it that the cicatrix may be as far backwards as possible.

The following are the brief notes of some of the cases.

CASE 1.—Jane H—, æt. 16, came under my care, 1857, with an enchondromatous tumour over the left parotid gland, the size of a large walnut, of six years' growth; it was quite painless, and moveable, and had a smooth and uniform surface. It was

excised, a bossy outgrowth at its base being found deeply placed within the gland. Recovery followed.

CASE 2.—*Enchondromatous tumour beneath jaw, size of orange; excision.*—A woman, æt. 24, came under my care, in November, 1861, with a large tumour, the size of an orange, beneath the left ramus of the lower jaw, of fourteen years' growth. It was nodular, elastic, and moveable, and gave rise to no pain. It was excised without difficulty, and recovery followed.

CASE 3.—*Enchondromatous tumour beneath the biceps femoris; cure.*—A woman, æt. 30, was admitted into Guy's, in February, 1858, under the care of Mr. Birkett, with a large tumour, the size of a cocoa-nut, beneath the right biceps femoris muscle. It had been growing for two and a half years, and had caused pain only from its size. It was readily excised, and was made up of cartilage-cells, bone, and fibre-tissue.

ON

TUMOURS, AND TUMOURS OF THE BREAST,

MORE PARTICULARLY IN REFERENCE TO THEIR DIAGNOSIS.

THE diseases of the breast have ever been subjects of great interest to the practical surgeon, while to the student they have always presented many difficulties, for it has only been within the last few years that their true pathology has been understood and the value of special symptoms duly appreciated.

To understand correctly the meaning of any single symptom, it is necessary to know the manner in which it has been produced; and to estimate with accuracy the value of a combination of many, it is essential that sound pathological knowledge should go hand in hand with close observation; for the diagnosis of a tumour of the breast is not to be determined by any definite pathognomonic sign, but by the presence or absence of many; the value of the evidence of any individual symptom depending on its association; and the combination of many alone guiding the surgeon with any accuracy to a right conclusion.

In the following pages I propose to consider briefly the subject of inflammation of the breast, and then to pass on to that of tumours, bearing in mind the fact that the same pathological principles which have been already laid down in former chapters of these reports, as applicable to tumours generally, are of equal value when applied to the tumours

of special parts, such principles being alone modified by the peculiar anatomical conditions of the tissues in which these growths are developed.

CHAPTER LVII.

INFLAMMATION OF THE BREAST.

IN the present chapter I propose briefly to consider the subject of inflammation of the breast, regarding it purely from its clinical aspect, and to dwell upon such practical points as the materials before me may suggest, noting only the more prominent facts which bear upon its pathology, diagnosis, and treatment.

It is scarcely necessary for me to discuss the question as to the true seat of the inflammation which attacks the breast, for there is fair evidence to prove that it may begin in the gland itself, as well as in the cellular tissue which connects it with the integument or with the muscles beneath. It may primarily involve the connective tissue which exists between the lobules as well as the true secreting structure of the gland.

It may exist as an isolated phlegmonous inflammation, or be of a more diffused nature. It may, if arrested, be therefore limited in its nature, or it may go on to involve in various degrees of severity the whole of the tissues which help to build up the true breast.

It may be acute or chronic in its nature, and, like inflammation in other parts, may disappear without any breaking up of tissue or suppuration, or it may be attended with most destructive local results, the extent of destruction of tissue depending upon the severity of the inflammatory process, and the amount of constitutional power of the patient who is the subject of the disease. As a rule, however, it may be stated that suppuration takes place. The treatment of the case necessarily has an important influence over the result; but of this more will be said as we proceed.

As a general rule, it may be asserted that inflammation of the breast attacks the gland when in a state of activity, and that it is exeptional for the passive organ to be the subject of this process; women who are either pregnant or suckling are, therefore, the most liable to this affection, although it is not unknown in the single nor in the unfruitful married woman.

When found in the virgin breast, it is often associated with some uterine disturbance or irregularity; and in certain examples it may be clearly put down as the result of an injury. But the bulk of cases are found in women during the period of lactation, and most frequently during the first and second months.

The truth of these remarks will beecome more apparent after the perusal of the following analysis of the cases before me.

Analysis of 102 Cases of Abscess of the Breast.

79 instances occurred during lactation.

2 " " pregnancy.

21 " " in patients who were neither pregnant nor lactating.

Of the seventy-nine instances which were found in women who were suckling—

35	occurred during the first month.....	} 72 per cent.
22	" " second month	
3	" " third "	
3	" " fourth "	
None	" " fifth "	} 12 per cent.
3	" " sixth "	
1	" " seventh "	
None	" " eighth, ninth, tenth month	

And 1 during the eleventh, twelfth, thirteenth, fourteenth, and fifteenth month respectively 6 per cent.

In 7 others the month was not stated.

It thus appears that nearly three fourths of the cases occurred during the first two months of lactation.

It is difficult to find a sufficient explanation of this fact. A fissured condition of the nipple may in certain instances suffice to give rise to the complaint, but the connection between the two is not so common as some men would lead us to believe, and as the majority of women who are the subjects of this

affection are cachectic and feeble, I am disposed to think that the true explanation of the cause is to be found in this fact, believing with Mr. Ballard that "abscess in the early months is due to the searching of the child after milk, before the gland is filled," in patients who have neither sufficient power to secrete, nor to resist the inflammatory process when once originated.

Seat of the Disease.

It has generally been stated that both breasts are equally liable to be affected with inflammation, but an analysis of the cases before me does not confirm this opinion, for of the 102 cases—

55	involved	the	right	breast	
30	"	"	left	"	
5	"	"	both	"	

And in 12 the side was not stated.

In the notice of other cases which have passed under my care, the right breast has been decidedly the most frequently involved.

In twelve cases which took place in girls under sixteen years of age, eleven were in the right breast and one only in the left.

Rapidity of Progress.

The rapidity with which inflammation of the breast progresses in different cases varies considerably, depending, as it does, on the acuteness of the inflammation and the resistance offered by the constitutional power of the patient. In certain instances the disease runs its course very rapidly, and passes on to suppuration within a very few days; in others, again, this result may not occur for weeks or months; and there is hardly a limit to the period for which a chronic abscess may remain in an inactive and indolent condition. The severity of the symptoms will necessarily vary, therefore, in degree, and the activity of their treatment must be proportionately influenced.

Abscess in the Male Breast.

It is not a common occurrence to meet with inflammation or suppuration in the male breast; still it does occasionally come under our notice, although amongst my notes of the

cases admitted into the hospital I am unable to find one recorded; from my private notes of other cases, however, I have two interesting examples.

CASE 1.—One was in a man, æt. 20, who came under my care in January, 1858, with suppuration of the right breast of two weeks' standing. He could give no history of having received any blow or injury. The abscess was opened, tonics were given, and a good recovery ensued.

CASE 2.—The second case was in a lighterman, æt. 34, who applied to me in June, 1862, with suppuration of both breasts, but in this case a distinct history was given of repeated injury from the striking of the oar. Both breasts freely discharged, and under the influence of tonics a recovery followed.

Treatment.—As already stated, the activity of the treatment of the affection we are now considering must be regulated by the acuteness or severity of the inflammatory process, and the nature of the constitutional and local symptoms to which it may give rise. As a broad truth, however, it may be confidently asserted that the inflammatory process is of a low type and of a destructive nature, and that, as the constitutional powers of the patient are generally feeble, nothing like lowering measures are to be adopted, but, on the contrary, soothing local applications and constitutional tonics, with sedatives, are absolutely demanded.

In cases of inflammation of the breast taking place during lactation I have never seen an instance in which any other principles of treatment than those I have just laid down could be entertained. The subjects of this affection have been always feeble, and want of power has been the prominent symptom. Under such conditions, therefore, soothing fomentations to the breast, either of warm water or of some medicated solution, as the decoction of poppies, are the local applications which give the most relief, although a light linseed poultice or some spongio-piline may be well employed.

Rest in the horizontal posture affords striking comfort to the patient, and, when it can be carried out, is of great prae-

tial advantage ; but if this desideratum cannot be secured, the whole breast must be well supported by a band or linen sling.

During this time tonics, in such a form as can be borne and may be demanded, should be freely given, quinine being probably the best. Stimulants, such as wine or beer, should be cautiously administered, few cases not requiring such an addition to their diet, and plenty of good nutritious food should be allowed.

A sedative at night is also very generally needed, for want of sleep from pain is a common accompaniment, the Dover's powder, in ten-grain doses, being the best form.

A mild purgative in the early stage of the disease may be called for, but everything like excessive purgation should be avoided, as the object of the surgeon is to supply power, and not to take it away—to soothe symptoms, and not to irritate.

On Opening the Mammary Abscess.

Upon the propriety of opening a mammary abscess there is amongst surgeons a great difference of opinion. Some believe it to be the best practice to let the breast alone, and to allow nature to complete the operation, whilst others advocate the making of an early opening. In neither of these opinions am I disposed to coincide, although I believe it to be a right practice to postpone puncturing the organ as long as possible, for any over-anxiety to evacuate the pus is not followed by a favorable result. Still, on the other hand, when the abscess is left to itself much unnecessary suffering is often endured, and a considerable sacrifice of skin often follows, entailing a longer convalescence and an uglier cicatrix. The practice I generally adopt is to leave the parts alone till I find pointing has taken place, and then to puncture, making my incision in a line radiating from the nipple of the patient.

By adopting this practice any unnecessary pain is also saved to the patient, for the appearance of pointing is left much to the observation of the surgeon, and it is not necessary to make frequent and careful physical examinations. Of course, some gentle manipulation is absolutely called for, to enable the surgeon to form an opinion, but the eye is the chief

guide, and not the finger. Much manipulation of the gland is both painful and injurious, but an absolute abandonment of all local surgical treatment can only be condemned.

Warm fomentations are in all stages of the disease very grateful to the patient, and may be freely used ; when early suppuration threatens, a light linseed poultice is probably the best application ; but when the abscess has discharged, the poultice may be laid aside, and wet lint alone be employed, for constant poulticing soddens the integument, and retards the process of convalescence.

On the Treatment of the Chronic Abscess.

The existence of a chronic abscess having been made out—a point, by-the-by, which will be returned to when the subject of the diagnosis of a mammary tumour is discussed—it becomes an important question what treatment should be pursued.

When the abscess is small, and is causing but little, if any, annoyance, it may be left alone, and, under the influence of tonics and local pressure by means of strapping, the fluid may be absorbed, for such a result is occasionally brought about. In the majority of examples, however, some more active treatment is required, and in these the evacuation of the pus is the chief point. If the abscess be large and deeply seated—a common condition—the drawing off of its contents by means of a trocar and canula is the usual practice, and it is generally believed to be the best ; but it has this disadvantage, that the wound generally soon closes, and a second operation is then required. The same treatment may be again resorted to, with the same results, and this drawing off of the pus and subsequent closure of the wound may go on for many times. At last, however, the opening remains patent, and the abscess contracts, leaving in the majority of cases a sinus. Under these circumstances a bolder plan of treatment seems absolutely demanded, for time is an important element in the consideration of any plan of treatment, and the best method appears to be a free opening at the first operation, or, what is still better, the draining off of the pus by means of a perforated india-rubber tube, introduced through the canula after the first operation.

I have followed this plan on several occasions with marked benefit, and can with some confidence recommend the practice.

On the Treatment of Sinuses.

The treatment of sinuses in the breast, as elsewhere, is always a task of some difficulty, and in certain cases all plans will be found to fail; but the one principle of practice which seems to be the most valuable is the establishment of a dependent outlet, for when this has been secured the upper sinuses, as a rule, heal. To gain this end, the introduction of a drainage tube, in the way already mentioned, is a valuable practice, and certainly a simple one.

Should there be many sinuses, some pressure may be employed, care being taken that the openings are left uncovered, and that a free passage is left for the discharge.

Superficial sinuses may be slit up, if other means fail, and in very chronic cases some irritant, as iodine, may be injected, to excite a fresh action, but the great principle of practice in these cases appears to be the one to which I have already alluded, although others may be at times demanded when this fails.

I have put this plan of practice into operation on several occasions, and have every reason to be well satisfied with the result.

CHAPTER LVIII.

ON THE DIAGNOSIS OF TUMOURS OF THE BREAST.

An Analysis of Cases.

THE object I have in view in the following pages is to elucidate the subject of diagnosis of tumours of the breast, and with this aim I shall proceed to point out the symptoms which characterise the simple and malignant tumours of that organ, and to dwell on such pathological points as may be required to make the practical consideration of the subject quite intelligible; to consider the value of each symptom, and the mode

of its production; and to distinguish the symptoms which may be described as being "special" from those that are "accidental."

By way of introduction, I shall first give a brief analysis of the cases before me, noting such points of interest as more particularly bear on the object I have in view.

For all practical purposes, tumours of the breast may be divided into the *inflammatory*, the *innocent*, and the *malignant*.

Amongst the inflammatory may be classed the cases of acute and chronic inflammation of the breast, whether terminating in suppuration or resolution, and also the cases of painful or irritable breasts which are found in the young or middle-aged.

It will, however, be foreign to my present purpose to dwell at any length upon the inflammatory conditions of the organ, for inflammations of the breast are not scientifically to be classed under the head of tumours, this term being properly confined to the presence of a new growth, possessing its own special vitality and power of increase. Nevertheless, inflammatory affections do approach the characters of tumours in certain points, and in the discussion of the diagnosis of tumours demand attention.

In the *acute inflammation* of the breast there is scarcely room for any doubt as to the true nature of the disease, for it is attended with all the symptoms which usually characterise inflammatory affections, and its usual termination by suppuration forbids the possibility of an error being entertained.

In *chronic inflammations* of the breast, however, this absolute certainty in diagnosis is not so easy, and in some cases a correct diagnosis would seem to be almost impossible. I have seen a chronic abscess in the breast removed for a cancer, and others have seen the same thing, and in the preparation jars of Guy's many glands the seat of a chronic inflammation have been discovered having been removed for diseases of a more serious nature.

Such mistakes as these, however, are not common, diagnostic errors gradually disappearing under an improved knowledge of pathology and of the value of special symptoms.

As the basis of my remarks, I propose to give an analysis of such cases as I possess.

Analysis of Cases of Adenocoele, or Innocent Tumours of the Breast.

In analysing the fifty-four cases of which I possess an accurate record, I have been guided by the example of my colleague Mr. Birkett, who has laid before the profession, in a masterly paper published in the 'Guy's Hospital Reports' for 1855, a complete account of the tumours which he has denominated adenocoele; and it will be seen that my analysis of cases, in their general results, will support the conclusions which he has there deduced.

I may add that, of the fifty-four cases I possess, thirty-five were admitted into the hospital under the care of my colleagues, and nineteen have occurred in my own practice.

The first point to which I will draw attention is the age of the patient when the tumour was first observed, and, adopting the division of Mr. Birkett into three periods of sixteen years—"the *first*, from birth to sixteen, which may be termed the developmental period; the *second*, from sixteen to thirty-two, the period of developmental perfection of the gland; and the *third*, from thirty-two to forty-eight and upwards, the period of functional decline"—it will be seen from the following table that—

Between birth and 16 years of age	3 cases appeared.
17 " 32 " 	30 "
33 " 48 " and upwards	21 "
—	
Total	54 cases.

17 cases commenced between 15 and 20 years of age,

14 " " 21 " 30 "	
11 " " 31 " 40 "	
10 " " 41 " 50 "	
2 " " 51 " 60 "	

And 27, or half the whole number, appeared before the patient was twenty-four years of age.

From this analysis it becomes tolerably clear that it is during the period of life at which the procreative organs are the *most active* that the adenocoeles, as a rule, make their appearance,

and this conclusion is supported by the facts which the following table well displays.

Social Condition of Patient when the Tumour first appeared.

27	were single, or half the whole number.
19	„ married and prolific.
7	„ „ „ sterile.
1	the condition was not stated.
<hr/>	
54	

But it must be observed that, in the nineteen married and prolific women, the growth appeared in eleven examples during pregnancy, in two during suckling, and in six some years after childbearing, these facts demonstrating to a nicety that it is when the gland is most active that these “new growths” are most frequently developed.

Table showing the Seat of the Disease.

Right side	28 cases.
Left side	23 „
Double	3 „
<hr/>	
	54 „

The right breast is seen to be as frequently the seat of disease as the left, but in a small proportion of cases both organs are attacked.

Analysis of Cases of Carcinoma of the Breast.

I possess the records of 222 cases, 180 of which have been admitted into the hospital, while 42 are from my private notes. I shall now proceed to give the results of a careful analysis of the whole number.

Age of Patient when the Disease first appeared.

Under 20 years of age there was no instance.					
From 21 to 30 there were 17 cases, or 7 per cent.					
31 to 40	„	68	„	30	„
41 to 50	„	78	„	35	„
51 to 60	„	42	„	19	„
61 to 70	„	17	„	7	„
<hr/>					
Total	.	.	.	222	cases.

Or, if we adopt the same divisions we have made for the adenoid tumours, it will be observed that—

Before	16 years of age	no case.
Between	17 and 32	there were 28 cases, or 12 per cent.
„	33 „ 48 „	126 „ 56 „
„	49 „ upwards „	68 „ 30 „
Total		222 cases.

57 per cent., or more than half, of the cases of cancer in the breast appearing during the period of life which has been denominated that of functional decline of the mammary gland, that is, between the ages of thirty-three and forty-eight.

Social Condition of the Patient.

Influence of Marriage, &c.

169 cases occurred in the married,	or 76 per cent.
48 „ „ single	„ 21 „
5 „ „ widow	„ 2 „

These proportions are very similar to those published by Mr. Paget and Mr. Sibley in the 'Transactions of the Medical and Chirurgical Society,' vols. xlv and xlii respectively.

Of the 169 married women, 123 had given birth to children, or 72 per cent. In 46 cases the women were barren.

It would thus appear that the married women are more liable to cancer of the breast than the single, and the fruitful than the barren; the one whose mammary gland has been in the most active condition being more prone to cancer than the sister in whom no demand has ever been made upon the special functions of the gland.

Again, if we look at our cases more closely, an interesting comparison may be drawn between the single and the married, more particularly in relation to the period of life at which cancer is most liable to appear; the inference to be drawn from the comparison well bearing out the opinion that cancer is the most liable to attack the gland during the period of its functional decline; for it is fair to believe that in the barren or single woman the mammary gland loses its functional activity at an earlier period of life than it does in the married and fruitful woman, the special functions of the breast being preserved in such till a later date.

The comparison will be best seen by looking at the two following tables, which I have placed side by side.

Tables showing the different periods of life in the Single and the Married at which Cancer is the most liable to appear.

Years of Age.	SINGLE.		MARRIED.		General average.
Between 21 and 30...	5 cases, or 10 per cent.		12 cases, or 6 per cent.		7 per cent.
„ 31 „ 40...	20 „ 41 „		48 „ 27 „		30 „
„ 41 „ 50...	15 „ 31 „		63 „ 36 „		35 „
„ 51 „ 60...	5 „ 10 „		37 „ 21 „		19 „
„ 61 „ 70...	3 „ 6 „		14 „ 8 „		7 „
Total cases	48	Total cases	174		

The evidence of the preceding tables, as far as it goes, indicates that cancer more frequently makes its appearance in single women before the age of forty than in the married or fruitful, and this accords with what we might expect, the functional power of the mammary gland in the single woman declining at an earlier period of life than in the married.

If we take Mr. Birkett's three periods for comparison, the same result becomes manifest.

	SINGLE.		MARRIED.	
Between 17 and 32 years of age,	8 cases, or 16 per cent.		20 cases, or 11 per cent.	
„ 33 „ 48	„ 31 „ 64 „		95 „ 54 „	
„ 49 and upwards	9 „ 17 „		59 „ 33 „	

Table showing the frequency with which it attacks either Breast.

Right side.....	in 120 cases.
Left „	95 „
In both.....	7 „
Total.....	222 „

Hereditary Predisposition.

It is always difficult to obtain any accurate account from hospital patients as to their hereditary predisposition to cancerous disease, and it will be seen that it is only in a very small number of the cases from which this analysis has been made that any such history could be obtained; although it must be added that it was a point which I always took considerable

trouble to bring out when taking notes of the cases as they passed under observation.

Out of the 222 cases some distinct history of the presence of a cancer in some member of the family was obtained in twenty-two instances, or in about 10 per cent. of the whole number; eighteen of the twenty-two cases having had one cancerous relation, while each of the remainder had two relatives affected.

Table showing the time the Disease had existed before the Patient came under observation.

In 11 cases the disease had existed 3 months							} 57 cases, 1 year.
9	"	"	"	from 3 to 6 months			
37	"	"	"	6	12	"	} 41 cases between 1 and 2 years.
26	"	"	"	12	18	"	
15	"	"	"	18	24	"	
12	"	"	"	2	3	years.	
10	"	"	"	3	4	"	
6	"	"	"	4	5	"	
5	"	"	"	6	7	"	
2	"	"	"	8		"	
1	"	"	"	9		"	
<hr/>							
133 cases.							

In all of these the disease was excised, and nine died, or 6·7 per cent. Eighty-nine cases were left untouched, eight of which died, and the remainder disappeared from observation, relieved in various degrees.

Respecting the recurrence of the disease after operation, it would have been desirable to have added a few words, but the difficulties attending such an investigation, and the unsatisfactory information which my notes afford, forbid my putting forward any conclusion upon the subject.

The same observation applies to the influence of age upon the operation, and the influence of the operation on the duration of life, for it is almost an impossibility to follow up the cases of cancer when they leave the hospital, and thus to arrive at any safe conclusion.

It is to be regretted that this should have been the case, but such it is, and I have therefore thought it better not to give any, rather than give deceptive, statistics.

With this brief analysis, therefore, of the simple and

malignant tumours of the breast, I propose to pass on to the more special subject of the diagnosis of tumours.

CHAPTER LIX.

ON THE CLINICAL EXAMINATION AND DIAGNOSIS OF A TUMOUR OF THE BREAST.

THE first point a surgeon has to determine when consulted by a patient who has "something the matter" with her breast, shapes itself in some form or another into the question as to the existence or non-existence of a tumour. That is, is there a new growth developed behind, within, or in connection with, the mammary gland? or is the disease from which the patient is suffering situated in the tissue of the glandular structure itself? This first and most important question is one which must needs be solved before a further step can with any safety be taken towards the formation of a correct diagnosis of the case, and it is quite impossible to magnify its importance. To do this, however, considerable care is needed, and some manipulative skill is called into requisition; for a careless examination will surely end in an uncertain diagnosis, and with this a failure in treatment must necessarily follow. In examining a breast, therefore, with diagnostic intentions, the surgeon should take the whole gland in his hand; he should manipulate it gently and in every part with his fingers and thumb; and by these means he will, if an isolated tumour is to be found, in all probability detect its presence; if, however, he be uncertain upon this point, he should make the patient lie down, and if a new growth then really exists he will at once discover it. "If a patient be sitting or standing, and the breast is grasped by the finger and thumb, when induration of the gland itself exists, a sensation is felt as if a tumour were present. If, now, the palmar surface of the fingers be pressed flatly against the chest in the same part, nothing remarkable is distinguishable. If a tumour or new

growth exists, however, it is immediately perceptible. But if any doubt arise in the matter, the patient should recline when under examination; and then, if there be a tumour, it is immediately manifest to the touch, and often to the eye.”¹

Having, then, detected the presence of a tumour, that is, an independent growth, developed in the neighbourhood of the breast-gland, and probably in connection with it, the question arises as to its nature. Is it a simple tumour, or is it a malignant one?

If the tumour be moveable and hard—if it be quite free, or if it has but a very uncertain connection with the gland structure—there is a strong probability that the tumour is of a simple nature; and, if it has existed for several months, this probability becomes stronger, for it is an early characteristic of the *cancerous* tumour, even when primarily developed as a tuber, or as an independent structure, to associate itself and to become connected with the neighbouring tissues; and if this has not taken place, the absence of these conditions enhances the probability of the simple nature of the growth under examination. If the patient be also young and healthy, and if no other abnormal conditions, either of the breast or neighbouring structures, are to be detected, the probability becomes a certainty, and the presence of an “adenocoele” may be determined on.

For these *adenocoeles*, as a rule, appear in the young and unmarried; in the comparatively healthy and robust. They appear during that period of life when the procreative organs, and amongst them the mammary glands, are in a state of “developmental perfection;” and when attacking the married woman, they most frequently are developed during pregnancy or suckling. They are never associated with any other symptoms than such as can be produced mechanically by their presence, they never involve the integument except by distension, and the skin is never infiltrated by any new material. They are never accompanied by any secondary enlargement of the absorbent glands, nor associated with any secondary deposits; they never cause any cachexia nor undermine the health of their

¹ Birkett, ‘Guy’s Reports,’ 1855, p. 135.

possessor, they affect the patient solely through local influences, and demand treatment chiefly from local considerations.

As local affections, they are, however, at times exceedingly distressing. As long as they remain small and quiescent, they are of small importance; and being moveable, and unaccompanied by any other symptom, they are readily diagnosed; but when years have been allowed to pass, and their growth has increased, when from their greater size they become burdensome, and press on neighbouring structures, they are neither of small importance nor are they readily to be distinguished. But yet, if careful observations are taken, an error in diagnosis should not be made.

For although the breast itself may be much pressed on, or even expanded over the tumour, it will still exist, and on careful examination its presence, as a rule, will be made out. The nipple, although flattened from the extreme glandular expansion, can still be seen, but it is hardly ever retracted.¹ The integuments may be stretched to an extreme point, yet they will still be moveable and sound, although some inflammation from over-distension may have made its appearance, and large veins are always to be observed meandering in the healthy tissue. The tumour, if solid, may appear lobulated, and, if containing cysts, fluctuation may be detected. Still, the disease is essentially a local one, and affects the patient through purely local considerations.

The Diagnosis of a Tumour which is evidently caused by some partial or general Enlargement or Infiltration of the Mammary Gland.

Let us suppose, however, that the surgeon has a case of disease of the breast before him in which the structure of the gland is itself involved; that there is no independent moveable tumour, such as we have been considering; but that it is evident on manipulation that the malady, whatever it may be, is intimately connected with the gland structure.

What is the case? Have we an inflammatory affection only

¹ I have seen but one exception to this rule.

of the organ, or have we some simple hypertrophy or innocent enlargement? Is it a simple disease, or is it a malignant one?

If the manipular indications of the mammary gland are those only of enlargement, is such a condition due to pregnancy, or is it the product of a simple hypertrophy, confining the meaning of that term to an excess of growth?

If the increase be due to hypertrophy, which, by-the-bye, is an exceedingly rare condition, this has been to a certainty of a chronic nature, its increase has been slow and its growth painless; it is simply characterised by an increase in size, and beyond that can hardly be regarded as a disease; there is certainly no increase in action beyond that which growth demands.

If the enlargement be due to pregnancy, there can be little difficulty in the diagnosis, for it is attended with an activity of the local circulation, a general fulness of the gland, an enlargement of its veins, and a darkening of the areola, which will not fail to excite suspicions. Besides this, *both glands* will be similarly affected, a coincidence which is rarely seen in any morbid condition. The very suspicion of pregnancy, however, will be enough to call attention to other points, by which a solution of the difficulty will be obtained.

Is the enlargement to be explained by any inflammatory condition? I do not mean an acute inflammatory condition, for such an affection has features which are too characteristic to require any further allusion; but is this infiltration of the gland, which is present, to be explained by some chronic inflammatory change, such as is so frequently found in the female breast? In certain patients—that is, in the middle-aged—when cancerous affections are to be looked for, the presence of an indurated mammary gland, whether it be partial or complete, must always be regarded with suspicion, and in certain cases I believe it to be an impossibility to form any certain opinion as to its true nature. If the induration of the gland be the only symptom, and this induration be associated with a sharp pain, or even a dull one, either a simple chronic inflammation of the gland may be indicated, or the early condition of a cancer; under such circumstances it is as well to wait before giving any

positive opinion; if, however, much time has already passed, say many months, and no other symptoms have made their appearance, there is some good ground for the hope that the enlargement may be due to inflammation, for infiltrating cancers are not generally inactive—as a rule, are not stationary—and soon give rise to other symptoms, such as some enlargement of the absorbent glands, although this may be slight, some slight dimpling or drawing in of the skin, an important sign; or some more marked symptom, such as infiltration of the integument. A retracted nipple is also a frequent accompaniment of a cancer, but this is only an accidental symptom, such as may be caused by several conditions, and is not by any means characteristic.

If, however, any one or all of these symptoms show themselves soon after the first appearance of the lobular enlargement of the mammary gland, an opinion as to the cancerous nature of the growth may be confidently expressed. If, on the other hand, none of these symptoms make their appearance, and the induration or infiltration of the lobes of the gland remain stationary, or show some tendency towards improvement, the probability of the simple character of the disease gains ground.

Should this induration of the mammary gland appear, however, in the *young subject*, there will be no reason to suspect a cancer, and it should rather be regarded as the result of some slight inflammatory effusion. There will, as a rule, be some increase of pain after examination, but there will be an absence of any other local symptom. There will probably be some irregularity of the catamenia and some signs of general excitability of the patient. But as a local affection, there will be only the one symptom of induration of one or more lobules of the mammary gland, which, *in the absence of all others*, may with safety be regarded as inflammatory.

The same argument holds good when the disease appears at a later period of life, although our suspicions of a cancer should rightly be excited; still, the positive diagnosis must be postponed till, by the lapse of time, some other symptoms, such as those already mentioned, make their appearance, to clear up all doubt, or by their absence prove the innocent

nature of the affection. For the *cancerous tumour* of the breast most frequently appears in middle life, that is, when the procreative organs are verging towards their natural period of functional decline, such a period taking place at an earlier date in the single than in the fruitful woman. It attacks the married woman more frequently than the unmarried, and, when infiltrating or involving the breast-gland, is seldom stationary. Commencing, as it may, as a simple induration, the tumour will increase; it will gradually encroach on neighbouring tissues, and form attachments, becoming, as a consequence, more fixed; it will, sooner or later, involve the integument, at first simply causing a slight dimpling, and then a puckering; the skin will soon become less moveable, then fixed, and in a later stage will, like other tissues, be infiltrated with the same cancerous materials. The glands of the absorbent system connected with the breast will, in a cancer, soon show symptoms of enlargement, and this will in a later stage become so great as to press upon the nerves and veins of the arm, causing œdema to a greater or less extent. Ulceration of the integument, preceded by a softening down or breaking up of the tumour itself, will soon appear, and with this the characteristic infiltration of the margin of the wound, with its indurated, everted edges. A general cachexia, from the pain and wasting discharges, will soon show itself, and more or less distinct evidences of the complication of other organs, and under such circumstances the end is not far off. The disease has run its course, and with it the powers of its victim have been undermined, victory remaining with the strongest.

On the Development of Cysts in Tumours of the Breast.

In practice, many examples of tumours of the breast come under the observation of the surgeon, the diagnosis of which is much obscured by the presence of cysts, or rather what Mr. Birkett describes as capsules, containing fluid of divers characters; for the development of a cyst in the majority of tumours is a mere accident; it is not a new development, such as the more solid portion of the tumour, nor is it in any way to be compared with the simple cystic for-

mations which are found in the neck or other portions of the body; it is to be looked upon as a collection of fluid, probably serum, more or less blood-stained, and it is by its gradual accumulation that the more solid growths are separated, and an apparent cyst is formed. But this cyst is only spurious, for it has no special structure, its artificial walls being made up of condensed cellular tissue.

The existence, therefore, of false cysts, such as I have briefly sketched, in any of the breast tumours, whether adenoid or malignant, is to be regarded as a mere accident, for accumulations of serum are found to take place in any new growth, and thus may give rise to the cystic tumour.

The presence, therefore, of cysts in a mammary tumour has no weight in determining either the innocency or the malignant nature of the growth under examination; they are the product of a mechanical cause, and may consequently occur in either form; they are not special growths, nor are they of any intrinsic importance. The diagnosis of the tumour containing such cysts rests on other points, and more particularly on such as have been already indicated. As a rule, however, these so-called cysts are found in the less firm and solid forms of tumour, in those that contain less cellular or connective tissue, and in the more rapid developments rather than in the slow.

When found in the *adenocoele* or *innocent growth* the tumour will be more or less solid, but in the parts in which the false cysts or capsules exist the growth will be more lobulated and loosely connected; loose pedunculated growths will, in some instances, be seen lying within these capsules, their floating extremities being bathed with the so-called cyst contents; the different forms assumed by these tumours depending upon the amount of connective tissue which binds together the several lobes and lobules, and the dimensions of the interspaces which go to form the false cysts.

When these cysts are present in the *malignant tumour* they are produced in precisely the same way as in the innocent; but as the formation of the former differs from that of the latter, the cystic contents will vary also, the false cysts in the one instance containing the more or less solid characteristic lobules of the adenoid growth, whilst in the other case

they are filled with the less developed and more irregular, but equally characteristic, material which goes to build up the cancerous tumour.

On the Diagnosis of the "True Cystic Adenocoele" of the Breast.

The remarks I have just made respecting the importance of cysts in the innocent and malignant tumours of the breast are not applicable to every case; for to this rule, as to others, there is an exception, and in the present subject the exception is to be found in that form of cystic disease of the mammary gland which differs from the other forms of adenoid or new growth—developed independently of, although allied to, the breast-gland itself, such as those already dwelt upon—for it is essentially a cystic disease of the gland itself, and is more particularly connected with its secreting ducts. It is, however, of an innocent nature, and pathologically is allied to the genuine adenocoele; it is the tumour originally described by Sir B. Brodie as "arising by a dilatation of portions of some of the lactiferous tubes," or by Mr. Birkett as "Cystoid formations, distinctly referable to the dilatation of a duct, or to a connection with one, and containing growths which appear to spring from their walls." These growths are strictly analogous in their structure to the pedunculated or floating bodies which have been observed in the other forms of adenocoele; containing, like them, a structure allied to the breast-tissue, and being composed of more or less distinct caecal terminations of newly developed ducts, with variable quantities of true connective tissue.

How, then, is such a tumour to be made out? and what are the special symptoms which characterise it from the other forms of mammary tumour?

First of all, it is to be looked upon as an innocent tumour, and, consequently, it will be found to affect the patient precisely in the same way as all other adenoid tumours, in a purely local manner. It is to be regarded as a local disease, which at no period of its growth and in no way affects the patient otherwise than through local causes; it is never associated with secondary glandular enlargements or with

secondary deposits in other tissue, as in the cancerous tumour, and we must therefore look to local symptoms to guide us in the formation of a correct diagnosis.

It is to be remembered that it is a *genuine cystic disease*. The tumour is always made up of cysts, possessing solid contents in different degrees; but the existence of cysts is uniform and characteristic. *It is also a disease of the gland itself*, unlike the other forms of adenocoele, whether cystic or solid, which are new growths, developed and growing independently of the mammary gland, although in some instances having a slight connection with it; this is a true cystic adenoid disease of the mammary gland, dependent upon the dilatation of its ducts, and has, therefore, in the majority, if not in all cases, some communication through the nipple with the external surface. As a result, this condition gives rise to a symptom which, when present, must always materially tend to confirm the impression which may have been formed by the careful observation of the case, and by the presence of those conditions to which attention has just been drawn, and that is, the power the surgeon has to evacuate some of the contents of the cyst or obstructed ducts through the nipple of the organ by gradual pressure.

A cystic tumour of the breast-gland, in a healthy woman, unattended by any other than local symptoms, and accompanied with the discharge of a clear or coloured viscid secretion from the nipple, which can be induced or materially increased by pressure, may with considerable confidence be set down as the form of disease we are now considering, and may with justice be described as the *true cystic adenocoele* of the mammary gland, in contradistinction to the false adenocoeles or other tumours, which have but little, if any, connection with the true gland-tissue, but which are new growths partaking of the nature of the breast-gland, according to the pathological law, which appears universal, that all new growths partake of the nature and peculiarities of the structure in which they are developed.

On the Open, Ulcerating, and Discharging Tumour of the Breast.

There is a period in the growth of any tumour situated in the mammary gland, or in its neighbourhood, when the integuments become so involved as to ulcerate or give way, and when a discharging surface or cavity exists which presents an aspect differing according to the innocency or malignancy of the growth with which it is connected. In the cancerous tumour it is almost needless to add that the open surface or discharging orifice will be distinctly cancerous; the integument itself or the margins of the wound will be found infiltrated with the cancerous material, presenting the thickened, indurated, and everted margin so characteristic of the cancerous ulcer, and which, when once seen and appreciated, can hardly be mistaken. Not so, however, with the innocent tumours, which are also liable to be connected at some period of their growth with an open wound and discharging cavity, for in these cases a very different condition presents itself to our observation; and to understand this difference it is essential to recall one or two points of difference which have already been mentioned in the nature of the innocent and malignant tumours.

It has been stated that it is the peculiar nature of the innocent tumour to affect the part in which it is developed purely mechanically; it may separate or displace tissues, but it never involves them in any other way.

On the other hand, it has been stated that it is the peculiar nature of all cancerous or malignant tumours to infiltrate and involve every tissue with which it comes in contact.

Applying, therefore, these two opposite features of the innocent and malignant tumours to those cases of both diseases in which the integument is materially involved, we shall readily understand how two very different local appearances will be produced; for in the cancerous, as just explained, the wound or surface will be characterised by all the peculiarities of the cancerous ulcer, whilst in the innocent tumour the integument will have given way purely from over-distension, and, as a consequence, the margin of the wound or discharging cavity will

look healthy, free from all appearances of infiltration, and rather as if cut or punched out mechanically than ulcerated.

This great difference between the two affections is most important and is very palpable, and often enables the surgeon to form a correct diagnosis in a case where otherwise a difficulty might be experienced.

In the cystic adenocoeles this healthiness of the margin of the wound is very marked, for it is not uncommon to find a sprouting and discharging intra-cystic growth protruding from the wound through the ruptured integument, and presenting a very doubtful and sometimes cancerous aspect; but if found projecting through an orifice of the integument which is un-infiltrated and apparently healthy, such as we have already described, the innocent nature of the tumour may with some confidence be declared.

*On the Value of the Retracted Nipple as a Symptom in
Tumours of the Breast.*

There can be but little doubt that the importance of this symptom of the retracted nipple has been considerably over-rated, and that as a positive indication of cancerous disease it has been over-estimated. It may coexist with a cancer in the breast, as it may with some simple or innocent affection; but, on the other hand, a cancer of the organ may be present unconnected with any such morbid condition.

For a retracted nipple may be described as an accidental symptom in the development of a tumour; it is the product of mechanical causes, and its presence is determined by the manner in which the gland is involved in the disease rather than in the nature of the affection itself. Should any tumour, simple or malignant—should any abscess, chronic or acute—attack the centre of the mammary gland, a retracted nipple, in all probability, will be produced; for as the disease so placed will necessarily cause material separation of the gland-ducts, their extremities—terminating in the nipple—must be drawn upon, and, as a consequence, a retracted nipple will be the result.

In the early stage of an infiltrating cancer of the organ this symptom is one of frequent occurrence, the nipple being

always drawn towards the side of the gland which may be involved ; at a later stage, however, of the affection, when the infiltration is more complete, the nipple may again project. In a central chronic abscess of the breast the retracted nipple is equally common, and in the true cystic adenoele it may be also present. In the ordinary adenoele, whether cystic or otherwise, it is rarely present, for very plain reasons, as these are not diseases of the breast-gland itself, but only situated in its neighbourhood ; in rare cases, however, such an association may exist ; in one case only have I ever observed it, and in that some blow or injury had preceded the development of the adenoid tumour, and it is open to a doubt whether the retracted nipple might not have been brought on by some chronic inflammatory condition, such a cause being well able to produce it.

On the Value of a Discharge from the Nipple for Diagnostic Purposes.

It is very questionable whether this symptom has really any material value for diagnostic purposes ; and when the discharge is slight or of a bloody nature, it certainly does not indicate any special affection. It is well known that in *cancerous* affections a discharge from the nipple is not infrequent, the fluid having the appearance of blood-coloured serum, but it is never profuse, there being rarely more than a few drops.

In the *ordinary adenoeles* this symptom is seldom present.

In the *true cystic adenoeles* this symptom appears to be of considerable value, for in all the cases which have passed under my observation, and in the majority of the recorded examples, this discharge from the nipple was a prominent symptom, the fluid being generally of a mucoid nature, and more or less blood-stained ; and although at times it occurred spontaneously, and with relief to the patient, at others it could readily be induced by some slight pressure upon the parts.

It exists, therefore, as a symptom in the true disease of the breast structure, whether cancerous or adenoid ; it is but slight and uncertain in the former, and more general and copious, in the latter, and as a means of diagnosis becomes of some value.

On the Importance of Enlargement of the Absorbent Glands as a Diagnostic Symptom.

When these are present with a tumour of the breast, they bear important testimony to the malignant nature of the disease; for in all the simple adenoccles no such complications exist, although in the inflammatory affections of the organ they may be produced.

Still, in some cases of cancer of the breast many months may pass away without the appearance of these enlarged glands, and in one case of which I have the record a year expired without giving rise to such a symptom. Nevertheless, when they are present they are of positive value, and point towards the malignant rather than the innocent nature of the disease.

On the Value of the Tubercular and General Infiltration of the Integument over the Breast.

If there be one symptom which affords more positive evidence than another of the cancerous nature of the tumour in the breast, it is the one we are now considering, for no such symptom is ever present in any inflammatory or simple disease of the mammary gland. It is a genuine tubercular or general infiltration of the integument with the cancerous product, and, as such, is of special value. It may be slight, from the mere shot or pea-like affection of the skin, to its more general infiltration; but in all stages it is equally characteristic, and speaks in positive language of the cancerous nature of the mammary growth, one tubercle telling as plain a tale as many.

On the Excision of the Breast.

There is little or no danger attending the excision of the breast, beyond that which accompanies any or even the smallest operation.

It is true that patients occasionally sink after having passed through the operation, from pyæmia, erysipelas, or other causes,

contingencies which attend any practice, but from the excision itself there is little danger to life. Of the 133 cases of cancer which I have noted in which excision was carried out, nine cases died, or about 6·7 per cent., death taking place in each from the following cause :

One from pyæmia, on the thirty-fifth day ; one from erysipelas, contracted several months after the operation, when the wound had healed ; two from acute bronchitis, three weeks and a month respectively after the excision ; one from profuse diarrhœa, on the eighth day, probably pyæmic ; one from hæmoptysis, in the third week ; two from exhaustion after a return of the growth, in three and six months ; and one from actual sinking after the operation, on the third day. The three cases which died from pyæmia and from diarrhœa, which was also probably pyæmic, and the one which sank on the third day, may, perhaps, with justice be directly assigned to the operation, but the fatal termination in the remaining six examples had no reference whatever to the excision.

In the operations for the innocent tumour of the breast there was no fatal instance.

In operating for cancer it is unquestionably the wisest course to excise the whole gland, and it is as well not to be over-anxious about preserving too much integument, for if any doubt exists as to its perfect healthiness, the suspected portion had better be excised.

It is always important, when dissecting out the tumour, to keep clear of all diseased tissues, and in fatty subjects to leave a fair covering between the incision and the tumour itself, for there is good reason to believe that an early return of the affection is too often to be explained by want of attention to the practice to which I have just alluded.

In the operation for "*adenocèle*," it is quite exceptional for the removal of the breast to be necessary, and in the majority of instances such a practice would be clearly unjustifiable. As a rule, the tumour is readily removed on making a clean section through its cyst-wall, and the breast itself is rarely injured, even by the operation. In exceptional examples, however, of this affection, it is absolutely necessary that the breast-gland should be excised, that is, where a large tumour is closely connected with it ; and in the genuine or true cystic

adenocoele of the mammary gland—in such examples as I have already quoted, and in those alone. In the removal of a small tumour not involving the breast the best practice is to make the incision in a line radiating from the nipple, and to manipulate the parts as little as possible; the surest plan being to cut well into the tumour, having previously raised and made it prominent by grasping it with the thumb and finger of the opposite hand quite at its base.

In cases of complete excision the best line of incision appears to be that which corresponds with the course of the fibres of the pectoral muscle.

After both operations steady and moderate pressure, by the application of a firm pad to either margin of the wound, possesses many advantages, and a more rapid union appears to follow such a practice than any other.

CASE 1.—*Cystic disease of the breast of fifty years' growth in an old woman aged seventy-three.*—E. C—, a healthy woman, æt. 73, was brought to me on October 5th, 1862, with an enormous tumour, the size of a soup plate, in her left breast. She was a married woman, and had one child, fifty years previously, and it was during her pregnancy that she first observed a small lump in her left breast. It was then, she stated, quite moveable, but she could not say whether it was connected or not with the gland itself. It had increased so gradually, and was so free from pain that she told no one of it till a very few months before her application to me, and then did so only on account of the assistance she required to dress it, as the discharge was profuse. When I saw her the whole of the left side of the thorax was covered with a morbid growth; it was in the position of the mammary gland, the nipple of which remained visible and apparently healthy. The tumour was moveable upon the chest, and presented an uneven bossy surface, with healthy, although thinned, integument stretching over it. At one part, however, there was a fissure, with a thin but healthy margin, through which sprouted a large fungating growth; from this there was a free and offensive scrous discharge, and through the fissure in the integument a similar fluid escaped in great quantity.

The absorbent glands were quite natural, and the general health of the patient was very good.

An operation was suggested, as the tumour could have been readily excised, and there was nothing in the general condition of the patient to forbid its performance, but consent was not obtained, and no further history can be recorded.

Remarks.—There was enough, however, to enable us to form a correct opinion as to the nature of the case, for it was clearly impossible for any other than a simple tumour to have existed for fifty years.

It had appeared during pregnancy and during young life, it affected the patient solely through local symptoms, and gave rise to no single appearance indicating any cancerous affection.

The fissured condition of the integument and the healthy character of the orifice were also strong points in proof of the simple character of the new growth, this fissure having evidently been caused by the expansion and rupture of a large cyst, while the sprouting fungus was clearly due to the increase of the intra-cystic growth.

It was, on the whole, a marvellous specimen of the cystic adenocele.

CASE 2.—True cystic adenocele, involving the whole mammary gland.—Mary D—, æt. 49, a barren married woman, was admitted into Guy's Hospital, under my care, in September, 1860, with a tumour at the upper part of her right breast, of two years' growth.

On her admission the tumour was about the size of an orange, quite moveable, and evidently formed part and parcel of the mammary gland; it was to a slight degree lobulated, and to the touch gave a peculiar knotted sensation, but was unconnected with the integument or parts beneath. The nipple was natural, but elevation of it caused marked traction upon the enlarged gland, clearly indicating a connection between the two.

There was no other symptom present, and no affection of the absorbent glands. Excision was performed, and a good recovery followed. Upon examination the tumour presented a beautiful example of the true cystic adenocele; the whole gland through-

out was, as it were, filled with cysts, none being much larger than a pea, and in some, intra-cystic growths existed, which had all the microscopical appearances of the true adenocle. Bristles could also be passed from many of the cysts through the ducts into the nipple.

Unfortunately, the specimen has been subsequently lost.

In this instance of the true cystic adenocle it was interesting to observe the universal character of the cystic disease; no portion of the gland being free from the affection, although in no case were the cysts large.

The age of the patient was sufficient to excite a suspicion of the cancerous nature of the growth; but its manipulative indications were not such as are present usually in these cases, while the perfectly healthy condition of the neighbouring parts and absorbent glands negatived the idea of its malignancy.

CASE 3.—*True cystic adenocle of the breast, from obstructed ducts.*—Caroline G—, a widow, æt. 43, residing at Hackney, was admitted into Guy's Hospital, under my care, on January 12th, 1862. She was a healthy looking woman, and had enjoyed good health; she had given birth to two children, and suckled both, the last having been born twenty years ago.

Her attention was first drawn to her right breast by the discharge of a viscid fluid from the right nipple, eight years previously, but at this time there was neither pain nor any apparent enlargement of the gland.

Two years subsequently she observed an enlargement of the breast about its centre, and shortly afterwards several other smaller tumours appeared in its outer side. At this period also pain first made its appearance; it was of a shooting nature, but was not constant, its severity appearing to depend much upon the presence or absence of the discharge from the nipple, increasing with the diminution of the discharge and diminishing with its increase. For six years the tumours steadily increased in size, till they formed one large mass, the size of a cocoa-nut; the nipple gradually became flattened, and at last retracted, the pain being of the same nature all through.

When the patient applied to me, a large tumour was very

evident, situated in the right breast; it appeared to involve the entire gland, and to be formed by it; it was nodular in shape, from the projection of cysts, and on firm pressure a bloody fluid could be pressed out of the retracted nipple. The tumour was moveable, and unconnected with the parts beneath; the integuments over it were much thinned, and adherent to it from recent inflammatory changes; the axillary glands were quite free from all symptoms of disease.

The distension of one of the cysts being very great, and threatening a rupture of the integuments, I was induced to tap it, when about an ounce of serum was drawn off, with much relief to the patient. On January 14th, however, as operative treatment was clearly needed, I excised the tumour, and rapid convalescence followed.

Examination of the tumour.—A section of the growth at once confirmed the accuracy of the diagnosis which had been made. The disease was evidently situated in the tissue of the gland itself, and was not a new formation distinct from the gland, as is seen in the more common form of cystic adenoid tumours developed in the neighbourhood of the mammary gland. It was apparently formed by a cystic dilatation of the gland-ducts, new intra-cystic growths, more or less pedunculated and branching, springing up within the cyst-walls. The structure of these intra-cystic growths was such as is generally found in all simple tumours of this nature, and showed under the microscope the caecal terminations of the ducts and the elements of the fibro-plastic tumour; the former appearances, however, predominated. It was a genuine and admirable example of that form of breast tumour which was first described by Sir B. Brodie, as depending upon an obstruction to the lactiferous gland-ducts.

Remarks.—The particulars of this case form a complete clinical exposition of the ordinary history and most prominent symptoms by which the true cystic adenocoele is usually characterised. It is true that the new growth appeared at a later period of life than the adenocoeles generally, but I believe it to be the case that this variety of the affection is more common in the middle aged than in the very young. The growth of

the tumour, or rather tumours, all of which were in the gland itself, was slow and painless, and the early appearance of the discharge from the nipple of the viscid fluid was very significant. The appearance of pain at a subsequent date, associated with the retention of the mucilaginous secretion, was a point of great interest, together with the diminution of pain when the discharge recurred, these facts clearly proving that the disease was cystic, and that the cysts had a very direct communication with the ducts, through which they could be partially emptied.

The retraction of the nipple during the later months of the tumour's growth demands a notice, as it illustrates the method by which the symptom is produced—the gradual expansion of the central cyst, and consequent traction upon the extremities of the ducts causing their retraction.

On the whole, the points for diagnosis were tolerably clear. Although the age at which the disease had appeared in the woman, and the fact that the disease was situated in the gland itself, were enough to excite some slight suspicions of its cancerous nature, nevertheless, on the other hand, overwhelming evidence existed as to the probability of its simple nature, the following points being the most important :

1. The painless nature and gradual growth of the tumour.
2. The simultaneous presence of several tumours in the same gland.
3. The perfect mobility of the growth to the last.
4. The healthy character of the integument over it.
5. The total absence of all indications of induration of the absorbent glands.
6. The good health of the patient throughout.
7. The copiousness of the mucilaginous discharge from the nipple, and the freedom with which the cysts could be emptied.

CASE 4.—*False cystic adenocoele, developed independently of the breast, with fibro-plastic elements.*—Sarah H—, a married woman, æt. 41, presented herself before me at Guy's Hospital, in March, 1862. She was pale and somewhat delicate in appearance, having suffered severely for some months from irregularity of the catamenia. She married at eighteen years

of age, and twenty-two years ago had her last and only child, which was stillborn.

Shortly after this event she observed a small tumour in her right breast; it was hard, moveable, and free from pain except when touched. She thought little about it, and did not seek advice till two years ago, when I first saw her; at which time a large solid tumour, the size of a fist, was readily detected, situated behind and quite distinct from the gland-tissue. It was moveable and very firm. An occasional dart of pain at times passed through it, but in other respects the woman was quite well, and sought advice simply on account of the mechanical inconvenience which the tumour caused.

There was then little doubt as to its nature, the history of the case and local appearances of the growth, all indicating that it was a simple mammary glandular tumour. I advised excision; but, from various domestic reasons, she was unable to come into Guy's, and disappeared from observation for upwards of two years, and came to me again in March last (1864).

The tumour had in this interval grown immensely; it was at least double its former size, and had so expanded the gland-tissue upon its surface that it was quite impossible to separate the one from the other. The nipple was quite flattened, but no discharge from it had ever been observed.

The surface of the tumour was irregular and nodular, apparently from the growth of cysts; but the axillary glands were quite healthy.

On March 11th I excised the growth, removing with it the breast-gland and some of the expanded integument, the operation being followed by a rapid recovery. On examining the growth its true nature was revealed; it had evidently been developed behind the gland in its own capsule, the breast itself being expanded over its surface, from which it could readily be separated.

It was composed of a large mass of new growth, which microscopically had all the elements of the fibro-plastic tumour, and this in the centre had softened down, forming a cavity containing a diffuent mass of broken-down structure. This fibro-plastic growth was nodular externally, and had thus given rise to the idea that many cysts had existed upon its surface.

On one of its sides a large cyst, with many smaller ones, was very evident, containing arborescent growths of the true adenocoele structure, showing under the microscope beautiful examples of the caecal terminations of the ducts as new formations.

On the whole, the specimen was a good instance of that variety of adenocoele tumour which is developed independently of the gland-tissue, which is composed of true adenocoele structure and fibro-plastic elements, showing at the same time how these two forms of tumour run into one another, and how, as in this case, they may even coexist in the same specimen.

Remarks.—This case, in its history and symptoms, forms a good contrast in many points to the one we previously quoted; for if the former was a good illustration of the *true* cystic adenocoele in every particular, the latter is equally good as illustrative of the *false* cystic adenocoele in all its details.

In the present case the tumour had appeared in early life, about the age of nineteen, and about the period of pregnancy; it was then hard, moveable and free from pain except when manipulated, and caused so little inconvenience for twenty years that she never sought advice, and afterwards only applied on account of the mechanical inconvenience of so large a growth.

When first subject to observation the tumour was very large, but could be readily separated from the breast-gland which was covering it in; it was then quite moveable, and unaccompanied with any other symptom. The integument over it was quite healthy, and the absorbent glands sound.

The general health of the patient was also unaffected, as may be guessed from the fact that even at this time she delayed any operative interference, not from the dread of the operation, but simply on account of the inconvenience her absence from home would cause, although it must be added she was in a very comfortable condition in life. In two years, the time which elapsed before she again sought advice, the tumour had considerably increased, and it was then quite impossible to distinguish between it and the true gland; cysts also had made their appearance, but in all other respects the symptoms

were the same, the integument, of course, being more stretched, but otherwise quite healthy. The nipple was flattened from mechanical causes, and there was no discharge from it.

The absorbent glands were also quite sound. Such a history as this could result in no other diagnosis than that of an innocent and independent growth, which, as already stated, it turned out to be.

CASE 5.—*False cystic adenocoele of the breast; excision; recovery.*—Mary A. W—, æt. 20, a healthy and single servant girl, was admitted into Guy's Hospital on March 26th, 1861, under my care. She was a servant, and had enjoyed good health, her catamenia being regular. Three and a half years previously she first accidentally discovered a tumour in her right breast; it was about the size of an egg, situated in the centre of the breast, behind the nipple, and did not cause her any pain. When she first applied to me, eighteen months before her admission, the tumour was the size of a small orange; it was perfectly globular, and of a firm nature; and in my note-book at that time I had marked the case as being one of cystic disease. The patient then disappeared from observation, and did not reappear till six weeks before her admission into Guy's Hospital.

During this period the tumour had increased very slowly, but latterly, its increase had been very rapid, and accompanied with considerable pain; for three weeks, also, she had experienced a discharge of a bloody fluid from the nipple, which could be increased by pressure upon the part.

The tumour was very large, measuring fourteen inches in diameter and twenty-two in circumference. It was globular, with the nipple in the centre; moveable, and uniformly elastic, fluctuation being easily perceptible. The skin was much thinned from mechanical distension, and on its outer side was red and inflamed. The gland could not be separated from the tumour.

On March 15th I tapped the tumour, and drew off a quantity of bloody serum and broken-down tissue, but to allow of its more ready evacuation, the opening was enlarged, when the finger without force broke up a large portion of the growth. Two and a half pounds of this material were taken away.

The largest portion of the tumour was, however, of a more solid nature, necessitating its removal by excision the following day. The breast-gland was then found to be intimately connected with the tumour, and was spread over it, its removal with a large portion of the integument being required. The patient's convalescence was very rapid.

On making a section of the tumour through the nipple and its centre its true nature was clearly revealed, and it proved to be an example of "sero-cystic" disease of the breast. At its lower part were many beautiful examples of intra-cystic growths, which readily turned out of their capsules; about the centre were similar growths infiltrated with blood and breaking down, and in the upper part little else than extravasated blood and clot were visible. Microscopically, all the elements of the fibro-plastic tumours were present, with badly formed caecal termination of the ducts, as found in the true adenocoele. (*Vide* Model 40¹⁰, Guy's Muscum.)

Remarks.—In the above case the disease was situated behind the breast, and, as it has been shown, independent of it; the true gland was spread over the new growth, and had no other connection with it, although when coming under observation it was impossible to separate the one from the other. The tumour occurred in a young woman and in a single one, having commenced between the age of sixteen and seventeen. It was of slow growth at first, but subsequently became more rapid, when cysts began to make their appearance. The discharge of a bloody fluid from the nipple was a point of considerable interest. The diagnosis of the simple nature of the growth was never difficult, the character of the tumour, the history of the growth, and its manipular indications, with the absence of any other symptom which could excite any suspicion of its malignant nature, forbidding an error in diagnosis being made.

CASE 6.—*Cystic adenocoele, with intra-cystic growths sprouting through integument.*—S. S.—, a childless married woman, æt. 56, was admitted under my care into Guy's Hospital on July 11th, 1863. She was a healthy looking woman, and had been the subject of a mammary tumour for five years; it had

primarily appeared as an independent moveable tumour, and had gradually increased. When she came under observation for the first time, two years previously, a distinct separation between the new growth and the breast-gland was to be observed, but at the date of her admission no such distinction could be made.

The tumour was very large, and the skin much distended, one part having given way two weeks before her admission, and through this projected some intra-cystic growths. The margins of the opening in the skin were quite healthy. The breast was excised on May 19th, and a good recovery followed.

The disease was a splendid specimen of the ordinary cystic disease. (*Vide* model, Guy's Museum, 40²⁰.)

CASE 7.—Carcinoma fibrosum of right breast; disappearance of local disease by natural processes.

H. B—, a healthy looking childless married woman, æt. 53, residing at Woolwich, came under my observation in January, 1857, with an ulcerating carcinomatous tumour of her right breast.

The disease had existed six years, and had been ulcerated for four, the ulcer at the time of her application being about the size of the palm of the hand. The growth was remarkably hard, and was firmly fixed to the muscles beneath. The axillary glands were also enlarged.

Her general health was very good, and no history could be obtained of any hereditary predisposition to cancerous affections. As the tumour excited little pain, she rejected its removal by caustics, and tonics were therefore given, water dressing being applied to the wound.

On March 3rd, 1858, the tumour had become much smaller, and several pieces the size of nuts had fallen off, having apparently been destroyed by the contraction of their own fibres; the growth was also considerably harder. General health still good.

May 25th.—Several tubercles had appeared in the region of the sternum and axilla. Another mass had fallen off, and the growth appeared to be withering. Health still good.

October 20th.—Much the same. The tubercles in the skin

are evidently enlarging; the original growth, however, goes on contracting.

December 30th.—Going on well. Tumour still contracting and crumbling away.

April 21st, 1859.—Tumour continuing to contract and to throw off pieces. Tubercles in the skin also becoming smaller.

November 20th.—Growth still smaller. Health good. No fresh tubercles. Axillary glands smaller and more indurated.

March 30th, 1860.—Large portions still fall off; growth contracting rapidly. Health good.

July 23rd, 1861.—Breast has nearly cicatrized, a mere linear cicatrix remaining, in which are one or two small tubercles. All the secondary tubercles of the integument have disappeared.

January 3rd, 1862.—Nearly cured.

June 1st.—Only one small piece, the size of half a nut, remains in the cicatrix. No fresh tubercles have appeared. The indurated glands in the axilla are hardly to be felt.

March 31st, 1863.—Breast shows merely a cicatrix, in which there is only one small nodule, the size of a pea. Otherwise the woman is quite healthy.

July 20th.—No change since the last report.

May 30th, 1864.—Breast is still in the same condition; one or two tubercles have appeared in the integument near the cicatrix, and have again disappeared. Two, however, are still present.

June 30th, 1864.—Patient much in the same condition. Her general health is good in every respect. Her local disease causes her no pain nor inconvenience. She considers herself to be well. One or two small tubercles still, however, exist in the integument.

Remarks.—This case is one of unusual interest. There is no possibility of an error having been made in the diagnosis, for the tumour and ulcerating surface presented all the features of a cancerous growth, and the natural history of the affection well confirms the idea then formed from its local appearances. The irregular surface of the ulcer, the induration and infiltration of the gland and integument, the enlargement of the axillary glands, and the presence of the characteristic tubercles in the

skin of the neighbourhood, were alone sufficient to indicate the true nature of the disease, and the repeated microscopical examination of the pieces of tumour as they crumbled away, with its cell structure, readily confirmed this opinion. The gradual crumbling away of the cancerous structure, from the steady contraction of its own fibres, is a point of great interest, as it is one of rarity, and it was a striking feature of this decay to observe how the growth from a florid colour gradually became pale and anæmic, till it was at last thrown off.

The tubercles in the integument also passed through like changes as they gradually disappeared, the pink tubercle becoming white, and then by degrees fading away.

The cancer has now existed a good twelve years, and shows no signs of spreading nor of involving any internal organs, for the woman's health is in all respects good, and the local disease is now as torpid as it has been for many months.

CLINICAL SURGERY.

ON

DISEASES OF THE TESTICLE,

VESICO- AND RECTO-VAGINAL FISTULA,

AND

RUPTURED PERINÆUM.

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MDCCCLXVI.

ON
DISEASES OF THE TESTICLE.

CHAPTER LX.

ON HYDROCELE.

HYDROCELE, or a collection of fluid in close connection with the testicle or spermatic cord, is a term which surgeons have been in the habit of applying to two very different classes of cases—to cases which differ in their progress as well as their pathology, agreeing only in the one marked and prominent symptom to which the term hydrocele has been applied. For clinical purposes this comprehensive word may perhaps have certain advantages, and with this view it may still be employed, although in a scientific sense it is certainly to be condemned.

Accepting the term hydrocele, therefore, as signifying a collection of fluid in close contact with the testicle or spermatic cord, two great divisions of the subject at once suggest themselves; namely, hydrocele in some portion of the tunica vaginalis, either of the cord or testicle, and hydrocele as represented by an expanded and newly-formed cyst, this cyst being as a rule in connection with the epididymis, and but rarely with the body of the testis; the term *vaginal* hydrocele being applied to the former class of cases, and *encysted* to the latter.

On Vaginal Hydrocele of the Cord and Testicle.

I have thought it right, as tending to a clearer understanding of this disease, to consider simple vaginal hydrocele of the cord and testicle under one heading, for the pathology of both classes of cases is identical, and the principles of their treatment are much the same.

They are both produced by a collection of serous fluid within some portion of the tubular prolongation or sac of the tunica vaginalis; the terms hydrocele of the cord or of the testicle being applied to one pathological condition as it affects two different portions of the same serous membrane.

For a better understanding of this subject a few words concerning the formation of the canal, or serous sac, into which this serous fluid is poured, may perhaps prove acceptable.

On the Formation or Development of the Serous Sac into which the fluid of a simple Vaginal Hydrocele of the Cord or Testicle is effused.

It is well known by all physiologists that the testicle in its descent from the loin during foetal life draws with it into the scrotum two layers of peritoneum, both passing through the internal and external abdominal rings in front of the cord and its attendant nerves and vessels, both also passing into the scrotum, the posterior layer being in close connection with the fibrous capsule of the body of the testicle—the tunica albuginea—and the anterior in connection with the purse or scrotum.

In a perfectly normal condition it is generally supposed that at birth, or shortly after, the two surfaces of these serous membranes close and become connected, the canal which was at one time present ceasing to exist, and becoming a closed and withered channel, from the internal abdominal ring to the upper portion of the testicle. In the scrotum, however, the two serous surfaces are supposed to be permanently free, for the purpose of allowing easy and ready mobility of the testicles in their scrotal covering.

That the latter part of this supposition is correct there is

little room to doubt, for all anatomical and pathological investigations tend to show that such is really the case ; but it is not so clear that the former hypothesis is equally true, for it has been ascertained that the prolongation of the serous membrane down the inguinal canal and into the scrotal sac remains patent for a longer period than has been generally supposed, and that in some cases it continues more or less as a pervious canal during the whole of life. I would more particularly allude to the investigations of Mr. Birkett on the subject of hernia to confirm the truth of the above remarks, for he has demonstrated the fact, that in a large proportion of the examples of scrotal hernia the bowel descends into the open vaginal and scrotal process of the peritoneum which passes down to and covers the testicle.

The following anatomical facts in connection with this subject may, then, with some confidence be laid down :

That the opening into the peritoneal cavity at the internal ring is frequently open at birth and during the whole of adult life.

That the vaginal process of the peritoneum may remain as a more or less open canal during childhood, and even up to old age ; and that this tube may extend partially or wholly through the inguinal canal, and even into the scrotal vaginal sac.

That this naturally formed peritoneal tube and sac may be closed at the internal or external abdominal rings, or at any intermediate spot between these points, or at its junction with the testis.

As a consequence, it is tolerably clear that a collection of serous fluid may take place in any part of this prolonged serous channel, and that a hydrocele of the cord or testis of different kinds may be produced.

We thus find, during infant and early life, that a serous exudation may take place into the scrotal portion of this peritoneal sac, which is in direct communication with the abdominal cavity, from a want of closure at the internal ring or at some other part of its course. To these cases the term *congenital hydrocele* has been applied. In others, the serous effusion may be arrested at the external ring or at the upper portion of the testis, when a *congenital hydrocele of the cord* is said to exist. At early as well as late periods of life the

serous effusion may be confined to the scrotum, and may not extend higher than the external ring, this being the ordinary condition of *simple vaginal hydrocele*; in other instances, however, it may extend more or less up the canal, even as far as the internal ring.

In another class of cases the serous fluid may be confined between the internal and external rings, giving rise to the so-called *diffused hydrocele of the cord*; and when it occupies a still more restricted space, it is usually described as an *encysted hydrocele of the same part*.

The pathology of all these different conditions remains, however, the same, these differences in position being accidentally determined by the extent and lines of adhesion or by closure of the peritoneal testicular prolongations.

The Pathology of Hydrocele.

As a general rule, it may with considerable confidence be asserted that the secretion of the serous fluid which gives rise to the ordinary vaginal hydrocele is due to some inflammatory affection of the serous membrane; for in certain cases pure flocculi of lymph may be seen floating in the secretion, and in others spontaneous coagulation of the same may occasionally be observed. The thickening of the tunica vaginalis, which so frequently takes place in cases of long standing, and the presence of membranous bands and septa in the cavity of the same serous sac, points likewise to the same conclusion. This opinion gains support also from the fact that this form of hydrocele may be produced by extension of the inflammatory action from some portion of the epididymis or of the body of the testicle.

In another, although a smaller class of cases, it is not, however, so clear that an inflammatory action has any influence in the production of the serous effusion, for it would rather appear as if in these instances the exudation was of a passive nature, being merely an excess of the natural secretion of the serous membrane. It is to the congenital form of hydrocele that these observations are more particularly applicable, to that in which a communication still exists between the abdominal

peritoneal cavity and the scrotal serous sac; for it is certainly true that in many of these cases the fluid rapidly disappears under tonic treatment, the passive effusion being reabsorbed as the powers of the patient improve, and *vice versa*.

Nature of the Fluid.

The fluid of a vaginal hydrocele is invariably albuminous, for the secretion of all serous membranes contains albumen in solution, and under the influence of an inflammatory action, this albuminous nature is markedly increased; hence the amount of albumen in the fluid of a hydrocele is determined by the nature and violence of the inflammatory action. We thus in some cases, as in the congenital variety, find it as a thin, serous, and saline fluid, slightly tenacious and albuminous, and of a clear colour, the fluid varying in no single point from the natural serous fluid of the peritoneal cavity.

In others, again, it appears of a more tenacious character, varying in hue from a pale amber to a deep straw; in some examples it will be stained with blood, in others it may hold cholesterine in suspension, at times being perfectly opaque and syrupy from the presence of such matters. It is, however, in the old and chronic cases only that these last conditions are to be observed.

In the so-called *acute vaginal hydrocele* more or less fibrin will invariably be found either in solution or in the form of false membrane or adhesions between the two surfaces of the serous membrane; and in the *chronic* examples the walls of the cyst will be found to have undergone great changes, the thin clear membrane becoming thick and opaque, from the organization of the inflammatory product poured out into its tissue; while upon its surface this membrane presents a firm fibrous appearance, and in certain cases contains cartilaginous or ossific deposits. In rare cases suppuration has been observed to occur in the tunica vaginalis, but this result is beyond my experience, unless as the effect of some external irritation or plan of treatment which has been adopted for its cure.

Symptoms and Diagnosis of Vaginal Hydrocele of the Testicle.

Uncomplicated hydrocele, or a simple effusion into the tunica vaginalis, unassociated with any disease of the testis or epididymis, is generally a painless and insidious affection; it attracts attention mainly by its size, and demands treatment chiefly from the mechanical inconvenience it causes.

It is generally of slow progress, and, as a rule, will be found to have existed for many months when coming under the notice of the surgeon; the patient seeking advice only when the organ has become cumbersome, and from its weight has excited some pain and dragging in the lumbar region.

The Clinical Examination of a Hydrocele.

On examining a testicle, the seat of this disease, the enlargement will be found occupying the position of the testicle which will apparently have become part of the affection; it will be found also free and readily moveable. On inquiring into the history of the case, it will be learnt that the swelling appeared primarily in connection with the testis, gradually encroaching upon the upper portion of the scrotum towards the external ring, and on careful examination the cord will generally be distinguished above the tumour clear and distinct. In exceptional cases, however, it should be observed, the fluid will be found to pass upwards through the external ring, and up the cord as far as the internal ring; in such examples it is tolerably clear that the peritoneal testicular process has been closed only at one point, and that is at its internal abdominal opening. On taking the tumour in the hand it will be found to be light, and on passing the fingers over its surface it will be felt smooth and uniform. Fluctuation will also readily be detected on the slightest and most delicate palpation. The position of the testicle should then be looked for and made out; its natural site being somewhat posterior, and in large tumours towards their upper part. But it must be borne in mind that, in certain examples, the testicle may be in front of or below the tumour; that is, in cases in which the organ is inverted. The best test of its presence is afforded by manipulation; the peculiar testicular pain felt on the application of pressure affording a certain indication.

The question of translucency should next demand the notice of the surgeon, for when present it is of peculiar importance, as indicative of the vaginal hydrocele; but it must be remembered that it is not an invariable symptom; for it is neither present in cases of hydrocele in which the fluid is thick, bloody, or opaque, nor when the walls of the vaginal tumour have become thickened by fibrinous deposit.

It should be added that for this translucency to be well observed, the integuments of the scrotum should be firmly stretched over the scrotal enlargement.

The tumour is generally described as being of a regular and pyramidal shape, but this condition is very variable, for the shape of the swelling depends upon the openness of the tubular peritoneal membrane of the cord, and the connection which exists between the surfaces of the tunica vaginalis testis, and tunica vaginalis seroti. When the canal has closed and withered down to the body of the testis, the swelling will be more or less globular; and the higher the point of closure of the vaginal peritoneal sac towards the internal ring, the more pyramidal will the watery swelling necessarily become. Should adhesions exist between the two layers of serous membrane at the lower portion of the testis, the hydrocele will appear to be at the upper portion of the testis; and should bands of adhesion exist between the two surfaces, an irregular or even hour-glass contraction may make its appearance—the outline of a hydrocele depending much upon the anatomical conditions of the part in which it is situated, and the pathological changes which may have resulted from the affection.

The true pyramidal swelling is best seen in children, when the fluid will be found frequently to pass well up the cord. In adults it is certainly far from common. In the following case the true pyramidal shape was well seen.

Hydrocele of Testis passing up to Internal Ring.

CASE 1.—John R.—, aged 9 weeks, was brought to me, September 26th, 1864, with a remarkably tense hydrocele of the right testis, the size of an egg, of one week's duration; it passed upwards through the external ring, filling the inguinal canal to the internal ring, and even through it, no line of separation

being felt, the tumour having no neck. Tonics and cold lotions were employed, and a cure resulted in three weeks.

The Ages at which this Disease usually appears.

Hydrocele occurs at all ages, but it is somewhat common at birth and middle age, and the following analysis of my own cases well bears out the investigations of Curling and others on this subject :

			When coming under observation.			When the disease first appeared.		
Under 15 years of age			3 cases, or	2·4	per cent.	10* cases, or	9	per cent.
Between 16 and 20	„	9	„	7·25	„	11	„	10
„ 21 „ 30	„	31	„	25·	„	27	„	24·8
„ 31 „ 40	„	26	„	20·9	„	23	„	21·1
„ 41 „ 50	„	22	„	17·7	„	18	„	16·5
„ 51 „ 60	„	18	„	14·5	„	17	„	16·6
„ 61 „ 70	„	18	„	10·4	„	3	„	2·7
„ 71 „ 80	„	2	„	—	„	15	„	Not stated.
			<hr/> 124			<hr/> 124		

* 5 of which were congenital.

In the largest proportion of cases, hydrocele appears as a single affection, but it seems to affect the right or left testis indiscriminately. Curling tells us that of 115 cases, 65 occurred on the right, 44 on the left, and 6 were double; whilst of my own 117 cases in which these facts were noted, 41 occurred on the right side, 62 on the left, and 14 were double, and these results coincide with the opinions of Velpcau, Gerdy, and others.

By way of summary it may be said a chronic vaginal hydrocele appears as a painless swelling, and as an apparent enlargement of the testicle, of slow and unequal growth, and of variable size, with a smooth and uniform surface, and more or less tense and fluctuating feel; it is invariably moveable within the scrotum, and, as a rule, it can be clearly demonstrated to be distinct from any abdominal connections. The presence of the testis can generally be made out at its posterior and upper portion by the testicular pain on pressure; or by the absence of translucency at one spot—the tumour, as a rule, transmitting light when its scrotal coverings have been well stretched. It has a tendency to remain tranquil for many years, and by age simply

increases in size, occasionally growing to enormous dimensions, the penis becoming buried at times within the swelling; it never proves dangerous to life, and causes pain and requires treatment mainly from mechanical causes.

Symptoms and Diagnosis of Hydrocele of the Cord.

It has been already briefly explained how a hydrocele of the cord may be produced, and under what circumstances it may appear as a *diffused* or as a so-called *encysted* tumour. It has likewise been shown how these two conditions are but modifications of the same disease, the diffuseness or isolation of the affections being determined by the adhesion, or more or less complete closure of the vaginal process of peritoneum as it passes downwards into the scrotum.

It may appear as a *congenital hydrocele* of the cord, from a want of closure of the abdominal orifices of the vaginal peritoneal process, the serous fluid in such an instance gravitating downwards as far as the external ring, the original canal at this spot having been naturally closed, or it may present itself to our notice as a so-called *diffused hydrocele* of the cord, either at an early or late period of life, from a collection of serous fluid between the closed abdominal orifice of the vaginal process and the upper portion of the testis, the fluid being either arrested at the external ring, or passing through it to the upper portion of the testis. In a third class of cases it may appear as a small isolated bag of serous fluid situated between any of these points, moveable with the cord and connected with it, its circumscribed nature having been determined by a more complete closure of the vaginal peritoneal process, and by the limited space into which the effusion has taken place.

Under all these conditions, however, the pathology of the affection is the same, and the symptoms indicating its presence vary only according to the size and tension of the sac which contains the fluid. In the congenital form in which a communication exists with the peritoneal cavity, the hydrocele will never be found very tense—it will have a smooth and uniform outline, and will give all the symptoms of fluctuation; it will disappear also more or less readily by pressure, or by the patient assuming the recumbent position; the fluid then gravi-

tating upwards into the abdominal cavity, with a rapidity which varies according to the size of the peritoneal communication.

In the diffused hydrocele of the cord this disappearance of the swelling by rest or pressure will not take place, for in such the abdominal opening of the vaginal process will have naturally closed. The tumour will thus appear as a baggy or tense elastic swelling in the inguinal canal, which it will more or less fill. It will give to the hand a sensation of fluctuation, and in certain instances it may appear translucent; it will be found moveable on any traction of the testicle, and will be accompanied with pain in proportion to the amount of tension of the cyst or of the inflammatory action.

In the more localized or apparently cystic hydrocele of the cord the same symptoms will present themselves. The tumour will be more isolated, probably more moveable and more tense, and it will be readily acted on also by any traction on the testis.

It may occur as a single cyst or as many, but each will present the same symptoms. When a single, tense, moveable cyst exists it may be mistaken for a distinct morbid growth; but the diagnosis of the case ought not to be difficult when care is observed.

Treatment of Vaginal Hydrocele of the Testis.

In the *congenital hydrocele* so common in young life surgical treatment should be very simple, for the disease as a rule readily disappears with age and increasing strength: a little cold lotion applied to the part, such as a solution of the hydrochlorate of ammonia, is frequently sufficient, and tonic medicine often aids the cure; for, as I have already stated, the effusion into the vaginal sac in those instances seems to be often of a passive nature, and its re-absorption may be expected with renewed powers. In the following case the truth of the previous remarks was well illustrated:

CASE 2.—A boy, æt. 6, came under my care at Guy's Hospital in December, 1857, with a congenital hydrocele of the left testicle, about the size of a hen's egg. It had existed from birth to a certain extent, and had varied much from time to time in its size; during the last few weeks its increase had been very marked, and the boy's health had become much impaired; he was pale and cachectic, but no positive disease was

to be observed. The fluid could be made to pass backward into the abdominal peritoneal cavity by slight pressure, but it was evident the peritoneal opening of the vaginal process was very small. Looking upon this case as one of passive effusion, probably due to a simple cachexia, I administered tonics in the shape of quinine, and did not employ any local treatment: at the end of a week the hydrocele was smaller, and in two it had nearly gone, in the third week the swelling had disappeared, and for the time the boy remained under my observation, one month longer, no return had taken place.

I have treated many other cases of this description on similar principles and with like success, having never yet met with a congenital hydrocele requiring a different treatment. The hydrocele found in infancy, or *infantile hydrocele*, is not, however, always of the congenital form, for in these cases of infantile hydrocele there is no communication with the peritoneal abdominal cavity through the neck of the vaginal process. Under these circumstances a different treatment may be required to that which has just been recommended for the last. Cold lotions and tonics, however, in these may be of use, and should certainly be primarily employed, a good hope of success encouraging the surgeon in their use; yet in many instances the treatment will fail to cure the case, and some other more active practice will be demanded. *Acupuncture* may be then employed, and the fluid thus allowed to escape into the cellular tissue around the sac, from whence it may be altogether removed by so-called absorption; but this treatment is not as a rule satisfactory, it being exceptional for a permanent recovery to be secured by such means, and I am disposed to think it better practice to draw off the fluid by means of a fine trochar and canula, and then to excite some fresh action in the membrane lining the tunica vaginalis by stirring it up with the end of the latter instrument.

The following case illustrates the practice:

CASE 3.—*Hydrocele cured by tapping and stirring up.*—A boy, æt. 6½, came under my care with a hydrocele of the left testis of five months' standing: he had been under the care of another surgeon, who had unsuccessfully tried all the usual mild measures. His general health was good. I tapped the

cyst, drawing off a clear serous fluid, and well stirred up the tunica vaginalis with the canula: on the following day some swelling appeared, evidently inflammatory, accompanied with induration: on the fifth day this began to subside, and complete recovery followed.

CASE 4.—*Infantile hydrocele. Failure of acupuncture. Successful treatment by tapping and stirring up.*—William P—, æt. 13, came to me, Oct. 31st, 1864, with a large hydrocele of the right testis of one year's duration. He had been under a surgeon's care for some time, and had been treated by lotions and the continual application of iodine without benefit. I punctured the part with a needle in several points, and the scrotum soon became œdematous; in one week, however, all the symptoms had returned. On Nov. 17th I tapped the cyst, and stirred it well up, and by Dec. 20th recovery was complete.

The treatment of vaginal hydrocele in the adult next claims our attention, and in modern practice it has become very simple.

In early examples, when the hydrocele is still small, and consequently of little inconvenience, it is as well perhaps to leave it alone, for, unless causing anxiety to the patient, or proving troublesome or unsightly from its size, there is no necessity for interference. *In very old people*, again, it is as well not to interfere, unless a strong necessity exists, for sloughing of the scrotum, suppuration of the sac, and other bad results, occasionally occur in these cases from slight causes. It must be added, however, that the feelings of the patient are the best guide to interference, but slight enlargement causing in some patients as much pain as or more than great. Should, however, some treatment be demanded, as a primary measure simple tapping should be performed, the fluid being drawn off by means of a moderate-sized trochar and canula. In doing this some care is called for, although the operation is really a simple one, as difficulties are often made by the operator, and dangers result from want of caution.

On the Tapping of a Hydrocele.

As a point of primary importance, the true position of the testicle should be made out. In the majority of cases it will be found at the posterior part of the tumour, and unless this be

very large, towards its lower part. At times, however, when the testicle is inverted, it will be found in front, as well as in certain other cases which are difficult to explain; the true position of the gland can generally be made out by manipulation, and also by the want of translucency of the tumour at a certain spot. Having made out to a fair certainty the position of the testis, the tumour is to be taken in the left hand and grasped firmly at its neck, at the same time care being taken to stretch the integument well over the cyst, and to render the cyst wall tense and unyielding. The trochar and well-fitting canula is then to be taken in the right hand (it having been previously well oiled), and the index finger placed about three quarters of an inch from the extremity of the canula, the front of the thumb resting on its distal end, the object of the position of the finger being to prevent the instrument going in too far with a rush, and thus endangering the testicle, and that of the thumb to press home the canula over the trochar when being withdrawn. The tumour is then to be punctured at its lower part, care being taken to avoid any large vein, and the fluid allowed to run out. Having completely emptied the cyst, the punctured integument should be firmly held, and nipped up with the thumb and finger of the left hand, and the canula withdrawn, a little cold air or irritation of the finger generally causing sufficient contraction of the dartos to close the wound and prevent hæmorrhage or any further escape of the remaining fluid; a piece of lint may, however, be applied for purposes of cleanliness and to prevent friction.

In certain examples of this disease in the adult I have been induced to stir up the cyst as I have described in the hydrocele of the young, and have met with some success; in no instance has any evil consequence resulted from the practice, and in several a cure has taken place, evidently from inflammation. I would advise this practice to be confined, however, to young adults. As a palliative practice it is scarcely necessary to recommend any other than the one just described,—it is very simple, more efficacious than any other, and not more dangerous. Acupuncture has been advised, but it has no practical advantage over the simple tapping, and it is certainly less successful in its result. In exceptional cases it may be good, particularly in such a case as Mr. Curling has related on the

authority of Mr. Luke, of a gentleman who was about to proceed to a part of the world where surgical advice could not be secured, and where the patient could then perform this simple operation on himself.

The period of relief which a patient experiences from a simple tapping varies exceedingly from a few weeks to many years ; and even in the same patient the interval will be found to vary from time to time. In the young and middle-aged adult, when the general health is sound and a return of the effusion has taken place, unless any personal objection should be made, it is generally advisable to adopt some plan for a more permanent cure, and that leads me to consider what is generally described as the operation for the radical cure ; in old men, however, it is the soundest practice to rest satisfied with the palliative treatment, as it is only in exceptional cases that the radical cure should be proposed.

On the Radical Cure of Hydrocele.

It is not necessary, in a clinical paper like the present, to review all the various plans which have been, and are now employed, by different surgeons at different times, for the permanent cure of a vaginal hydrocele ; it will be more to the purpose to give the conclusions to which my own experience has led me, and which tend to support a line of practice which is most successful and very simple, viz., the injection of the cyst with a solution of iodine. It is not perhaps a question of much importance whether the fluid should be concentrated or diluted, or whether it should be permanently left in the cyst or withdrawn after a few minutes have been allowed for it to act upon the surface—such minor differences may be left to the fancy of the operator. But my own judgment leans towards the practice of injecting a mixture of two drachms of the compound tincture of iodine with a like quantity of water, and leaving it in, care being taken that the canula should be previously well pushed home into the cyst, and that no iodine solution be allowed to escape into the cellular tissue outside the sac.

By this practice a radical cure is almost certain to be secured ; it being purely exceptional for any failure to follow

this method or any evil to result, for when failure follows, it is generally due to the fact that a hydrocele has been injected when some inflammation of the testicle coexists, and from which it has been produced, for in all examples of hydrotestitis the practice of injection must be looked upon as being bad, as it is treating the result of a disease, and not the disease itself—the effect, and not the cause.

I do not propose to enlarge upon the other forms of treatment which have been employed, as incision, caustic, or even setons; for the practice I have advocated is so simple and successful as to surpass all others.

Treatment of Hydrocele of the Cord, with Cases.

The principles of treatment which have been laid down in cases of hydrocele of the testis are likewise applicable to those of hydrocele of the cord, their application requiring only such modifications as may be demanded by the altered position of the affection.

In the *congenital* hydrocele no special treatment is required, for, as strength comes to the child, the fluid will probably be reabsorbed, and should this result fail to follow, tonics should be given to expedite the cure.

In the *diffused or encysted* hydrocele of the child or adult more active treatment is frequently demanded, but not in all cases; for the fluid will at times disappear without treatment, although it may be to recur at a later date; still the affection ceases to trouble, and, unless some real inconvenience is produced by its presence, it is as well to leave things alone. Should, however, pain or inconvenience be experienced, something must be done, and without doubt the best practice is to evacuate the fluid. In small, tense, encysted hydroceles the practice of evacuating the fluid by acupuncture is certainly a sound one; tapping by the trochar and canula is an operation of some difficulty where the cyst is small, and acupuncture answers in these small cases very well; it may be done with any needle, but probably a cataract needle is the best, several openings being made.

Should this fail and further measures be demanded, an incision into the cyst is probably the best practice, but this

should not be carried out unless as a last resource. Should, however, the cyst be below the external ring, tapping may be employed as in any other case of ordinary hydrocele.

The radical cure by injection I have never used or seen employed, and there are mechanical reasons against the practice; the treatment by incision is the best in these cases, and answers every purpose.

The following cases of hydrocele of the cord may be read with interest, as tending to illustrate the different forms which occur in practice, and their different treatment.

CASE 5.—*Double congenital hydrocele of the cord down to external abdominal ring.*—John C—, æt. 10 weeks, was brought to me on September 6, 1860, with congenital hydrocele of the cord on both sides, filling the vaginal process of the peritoneum as far as the external abdominal ring. The fluid could be gradually expressed into the abdominal peritoneal cavity by manipulation. No treatment beyond a little cold lotion was advised, and in a month the child was well.

CASE 6.—*Double hydrocele; on the right side vaginal hydrocele of the testis; on the left side encysted hydrocele of the cord.*—William B—, æt. 6, was brought to me, April 8, 1858, with a vaginal hydrocele of the *right* testis of eight months' standing, coming on after a fall; and with an encysted hydrocele of the *left* cord below, but close to the abdominal external ring, of eight days' duration. The cyst was tense, the size of a walnut, and very painful, the testis being quite distinct below the cyst, and the child was very pale and cachectic. Quinine was given, and cold lotion applied to the parts. After two weeks had passed away without the local disease altering in its character, the hydrocele of the cord was tapped, clear serum being drawn off, and after two weeks no symptoms of return appeared. The fluid in the right tunica vaginalis showed symptoms of absorption. Tonics were persevered with for six weeks, when a perfect cure resulted.

CASE 7.—*Hydrocele of the cord protruding through the external abdominal ring.*—William F—, æt. 5 years, came under my care on August 25th, 1859, with a tense hydrocele of the right

cord, occupying the inguinal canal, and protruding through the external ring. It was very tense and painful, having existed for one year and a half. I tapped it at the external ring, and evacuated some clear serum; on September 26th no signs of a re-collection existed.

CASE 8.—*Encysted hydrocele of the cord at internal ring, simulating a hernia.*—Henry D—, æt. 10, came under my care on May 6th, 1861, with a tense cyst, the size of a nut, in the left inguinal canal, close to the internal abdominal ring. It had been observed for three months, and at times caused pain. The left testicle was in the scrotum. Traction being made upon the cord, the cyst could be well brought down, but on the parts being left alone, and the patient lying down, the cyst could be pressed out of view into the abdomen, or brought into view at will by drawing on the cord.

No active treatment was adopted.

CASE 9.—*Large hydrocele of the cord between the external ring and testis, cured by tapping and stirring up of the cyst.*—Robert L—, æt. 9, came under my care at Guy's Hospital, with a large hydrocele of the right cord, the size of a goose-egg, of some months' standing. The right testis was below it, and clearly distinct from the cyst. I tapped the tumour, drawing off some clear albuminous fluid, and stirred up the cyst; consolidation, followed by recovery, ensued.

CASE 10.—*Hydrocele of the cord cured by tonics and cold lotion.*—Thomas K—, æt. 16 months, was brought to me on July 25th, 1864, with a tense globular cyst, the size of half a walnut, in the left groin. It had been observed three weeks, and caused some pain. Traction on the testis failed to move the cyst, which apparently was held tight in the canal. The cyst was quite translucent. Tonics and cold lotion were given, and on August 22nd the fluid had disappeared.

CASE 11.—*Encysted hydrocele of the cord.*—Dennis P—, æt. 25, came under my care on April 3rd, 1865, with a cyst the size of a large walnut, connected with the spermatic cord in the right groin. It had existed for one month, and was

readily movable on making traction on the cord. He had had the same thing a year before, on the same side, but it had lasted three months, and disappeared.

The man being out of health, tonics were prescribed in the form of quinine, no local treatment being adopted.

On April 13th the cyst was smaller, and by the 24th it had disappeared, the fluid having been completely absorbed.

On June 5th the recovery was still perfect.

CASE 12.—*Hydrocele of the cord, with an undescended testicle.*
—W. W—, æt. 37, came under my care at Guy's Hospital, on July 3rd, 1865, with a swelling in the left groin of four days' duration. It was tense, fluctuating, and occupied the position of the inguinal canal. It was not, however, painful on manipulation. The testis was not in the scrotum. The man told me that the testicle had never come down lower than the inguinal canal; that its usual position was just external to the internal ring; and that occasionally he experienced considerable pain in the organ, relieved only by his pressing it upwards into the abdomen.

Quinine was given and cold lotion applied, and by July 12th the swelling had diminished. It was then made out that the testicle occupied the lower part of the swelling, and was near the external ring, the fluid occupying the cord down to the testicle; on July 26th the fluid had nearly disappeared, and on August 10th he was cured.

CHAPTER LXI.

ON ENCYSTED HYDROCELE OF THE TESTIS.

ON examining the testes of the adult after death it is by no means an uncommon occurrence to meet with small cysts connected with the epididymis; they may be single or multiple, and, in many instances, are very numerous; they are generally more or less pedunculated, and, as a rule, connected with the

upper portion of the epididymis, and are filled with a clear watery fluid, containing, in certain cases, some granules.

The pathology of the formation of these cysts is somewhat difficult to understand, and surgically it is of small importance, for they seldom, if ever, become of sufficient size to cause inconvenience, or to require any surgical interference; indeed they are rarely diagnosed during life, and are discovered only on post-mortem dissection.

Another kind of cyst is, however, occasionally met with connected with the testis, and in close contact, if not association, with the epididymis. It springs from the same part as the smaller cyst, but grows to much larger dimensions, and generally contains a very different kind of fluid. Its origin is as obscure as the former kind; it enlarges very slowly, does not give rise to any pain, nor produce any inconvenience other than that caused by its size. It seldom requires treatment in its early stage, and, as a rule, many years are allowed to pass before interference is demanded, the tumours frequently developing for twenty years or more before advice is sought.

These cases are by no means so common as the ordinary vaginal hydrocele—not more than 5 per cent. of the cases of hydrocele being of this kind.

A cyst is occasionally developed between the tunica albuginea of the testis and the tunica vaginalis testis, the pathology of which is very obscure. Cases of this are described by Curling and Hutchinson. The Guy's Museum contains a specimen. I know of no means of diagnosing their existence. Their treatment would be similar to that of other cysts.

Symptoms and Diagnosis.

In an early stage of this affection the diagnosis is not difficult, for the cyst usually appears as a kind of budding of the testis, or rather of the upper portion of the epididymis. It shows itself as a tense, hard, globular, and, in some cases, pendent tumour connected with some portion of the spermatic duct, being more or less intimately connected with it; and beyond these special symptoms it does not give rise to any others

worthy of record. It is generally discovered by the patient by accident, and, when as large as the natural testicle, has doubtless at times been set down as an extra organ.

It is rare, however, for the surgeon to be consulted in such a case in so early a stage, for, as a rule, the tumour will have been allowed to grow to an inconvenient size before advice is sought. In forming a diagnosis of the case its history will often at once throw some light upon the nature of the growth, for the surgeon will, in all probability, discover that its increase has been extremely slow, twenty years or more at times passing before the cyst attains anything like a large size; these encysted hydroceles probably never growing so fast nor acquiring such dimensions as the more common vaginal kind. *Extreme slowness of growth is, then, the first point to notice for Diagnostic purposes.*

The next feature which demands attention in the development of these cysts is of some value, for it is often rather striking, relating, as it does, to the shape and outline of the growth, for the encysted hydrocele never in its early stage, and rarely in any, assumes the appearances of an ordinary vaginal hydrocele. Appearing, as it does at first, as a kind of budding of the testis or epididymis, as the cyst enlarges it seems eventually to absorb the testicle, but it almost always maintains a globular outline, and never acquires that pyriform shape which is said to characterise the vaginal hydrocele. *The globular shape of the Hydrocele is the second point which tends to point out the nature of the case.*

The position of the testis in its relation to the cyst next claims attention, and in this a marked difference exists between the encysted and vaginal hydrocele. In the latter, as a rule, it is to be found at the posterior part of the sac, and towards its lower part. In the former, or encysted, it is to be found almost constantly in front, or at one side, or below, being but rarely found at the posterior part. The reason for this is readily explained. The cyst is usually connected with the epididymis, which normally lies at the posterior part of the gland. *The anterior position of the Testis is the third point which characterises this affection.*

The nature of the cystic contents now demands a notice, for it differs in many points from the fluid of a vaginal hydrocele and is very characteristic.

It will be remembered that in the *vaginal* hydrocele the fluid was described as generally clear, like the serum of the blood, more or less albuminous and of a straw colour, frequently containing fibrine in solution, and at times spontaneously coagulable, blood and cholestérine being also occasional elements.

In the fluid of an *encysted* hydrocele none of these elements are generally present, for it is, as a rule, a limpid, slightly saline liquid, more or less watery or opalescent, as if mixed with milk, always containing some granules in suspension, and frequently spermatozoa. *The nature of the fluid is consequently very peculiar, and forms a fourth material point for diagnostic purposes.*

The origin of the spermatozoa in these cysts is a point of peculiar interest, for it has been a disputed point with pathologists for many years. Mr. Curling's investigations on this subject have, however, fairly proved that in some instances their presence is certainly due to the rupture of one of the spermatic tubes which pass over and are in close connection with the walls of the cyst—this rupture taking place generally from an injury, and being indicated by some rapid increase in the size of the cyst; for Mr. Curling has shown that, in several of the cases in which spermatozoa were found, this history was given, and in some he was even able to demonstrate a distinct communication between the cyst and the spermatic tube.

The following case tends to support his views.

CASE 13.—*Encysted hydrocele of twenty years' growth; rapid increase after an injury; three distinct cysts, two containing spermatozoa.*—Robert P—, æt. 60, came under my care, at Guy's Hospital, on December 28th, 1863, with an encysted hydrocele of the left testicle of twenty years' growth. The increase had been very slow till the last month, when the tumour had doubled its normal size, this rapid growth having followed an injury produced by a fall.

When first under my observation the scrotum contained

an irregular cystic tumour on its left side, evidently made up of several cysts, of which three of large size could readily be distinguished, two being very tense, while the third was baggy. The testis was found on the inner side of the tumour.

Tapping was at once resorted to, and the largest cyst emptied, many ounces of a milky fluid being drawn off. The second tense cyst was then tapped through the same opening, with the same result, and the fluid collected in a distinct glass. The third cyst was also tapped, but in this the fluid was quite watery. The first two contained abundance of spermatozoa, the third did not contain any; a good recovery took place.

The treatment of Encysted Hydrocele.

However interesting may be the two forms of hydrocele which we have just been considering, both in their pathology and in their points of difference, practically the treatment of both is alike. When anything is required to be done, simple tapping may suffice, and as a primary measure it should always be preferred; but, should the radical cure be required, the injection by iodine may be carried out. The slow growth of these cysts, however, and the equally slow re-collection of their contents after tapping, are points which indicate the propriety of adopting the palliative treatment in the majority of cases.

On the spontaneous disappearance of a Vaginal Hydrocele, with a Case.

It is well known that in children hydroceles, as a rule, disappear spontaneously with little or no treatment, but in adults such a result is most uncommon. Mr. Pott, Sir B. Brodie, and Curling relate cases of this kind, and attempt to explain the process by which such a recovery takes place with more or less happiness. A single instance of the kind has passed under my hands for treatment—a brief record of which follows:

CASE 14.—Charles C—, æt. 64, came to me at Guy's Hospital on Jan. 29th, 1863, with a hydrocele of the left testis, the size of

a cocoanut. He had had it two years, and had been tapped six times, having been under my care on each occasion. He came under my notice at this date, when I was about leaving the hospital, and I did no more than examine the parts which were tense and rather painful, telling the patient to return to me, in the course of a few days, to be relieved. When he came the following week all indication of swelling had completely disappeared, the man assuring me that he had gone to bed the night of the second day before his visit with a large tumour, and that when he awoke it had disappeared. He added also that he had on the following morning passed a large quantity of thin urine. The patient was a steady man and a widower, and told his tale with all the appearance of truth and with some astonishment.

In three months the fluid had re-collected, when he was tapped.

I will not attempt an explanation of this case.

CHAPTER LXII.

ON HÆMATOCELE.

As the term hydrocele is applied to the effusion of serous fluid into the sac of the tunica vaginalis, and of its tubular prolongation upwards to the internal ring, as well as into the cysts which have been already described as being connected with the testis, so the term hæmatocele is employed to designate an effusion of blood into the same regions. We thus have—

A vaginal hæmatocele of the testis and an encysted.

A diffused hæmatocele of the cord and an encysted.

Hæmatocele may occur in an organ which had not previously shown any symptoms of disease, or it may be associated with a hydrocele. It may appear spontaneously without an injury, or as the result of a blow, strain, or the tapping of a hydrocele.

It may attack patients at any period of life, and in certain rare cases at a very early age, even in infancy, and I have the records of a case in which it was said to have made its appearance at two years of age.

In the notes of my cases various causes have been assigned for its production. In one instance "it appeared gradually without any known cause." In another "it occurred when hard at work pushing a wheelbarrow, something giving way with a snap." In the majority it came on as an immediate consequence of a blow, and in several as the result of the tapping of a hydrocele. In all, however, the result was the same—a more or less rapid formation of a tumour in the position or neighbourhood of the testicle.

Symptoms and Diagnosis.—The symptoms of a hæmatocele which has made its appearance without any injury or assigned cause are very obscure, and are pretty well summed up in the prominent one of a gradual and uniform enlargement of the organ. The swelling will vary in shape as in the hydrocele, but, like it also, it may present a more or less pyriform outline. The testicle will always, in the vaginal hæmatocele (on careful manipulation being made), be detected somewhere in the sac, and usually at its posterior and lower part, the peculiar testicular sensation being produced by slight pressure.

When caused by a sudden strain or injury the enlargement will be more sudden and rapid, it will be found to follow close upon the receipt of the accident, and the rupture of the blood-vessel may even be announced by the sensation of a sudden snap or giving way.

The local symptoms will be similar to those already described.

The tumour, at its first appearance, may be somewhat soft, and obscure, or clear fluctuation may at times be detected in it. But if much time be allowed to pass before coming under observation, this fluctuation will not, in all probability, be made out, for the effused blood rapidly coagulates, and gives rise to the sensation of a solid growth. The sac of the hæmatocele, whether tunica vaginalis or cyst, rapidly alters in character and becomes thick, and in certain cases, fibrous or even cartilaginous, at first from the mechanical coagulation of the

fibrine of the blood upon its inner surface, and in cases of longer standing from distinct inflammatory changes, brought about by the presence of the blood acting as foreign matter. In some instances this thickening of the cyst is very great, even to half an inch.

When a hæmatocele has followed upon a hydrocele, there will usually be a sudden enlargement of the part after the strain or injury, accompanied with more or less pain, this pain apparently depending upon the amount of distension to which the cyst has been subjected. Should it follow the operation of tapping it will, as a rule, be recognised by the escape of more or less blood or bloody fluid at the time of the operation ; and the rapid re-filling of the hydrocele sac or cyst with a more solid and opaque material.

To form a correct diagnosis of hæmatocele the history of the case is most important, indeed more so than the local symptoms, for it is certainly true that by these alone, in some instances, it is almost impossible to make out the true nature of the affection.

By way of summary it may be stated that a hæmatocele is usually a uniformly smooth, tense, and *non-transparent* tumour, with an *indistinct* sensation of fluctuation, but with *distinct* evidence of testicular pain on pressure. It may be accompanied with pain during the early period of the affection, from the distension of the cyst, but not at a later date, or during its chronic stage, unless softening down. As time passes it will become harder, should no symptoms of inflammation show themselves ; but on their manifestation, evidence of suppuration will soon appear, for hæmatoceles have not, as a rule, a disposition to remain quiet, as the hydroceles, but tend to open outwards by the breaking up of the coagulated blood which has been effused, and the inflammatory process.

The symptoms which indicate the presence of a hæmatocele of the spermatic cord are somewhat similar to those already described for vaginal hæmatocle, the difference in locality being remembered ; and it is generally produced by a blow or strain, as is the ordinary vaginal hæmatocele. It is to be diagnosed by the suddenness of its appearance, or the suddenness of the enlarged hydrocele sac—by the opacity of the swelling, and tendency to consolidation which it possesses,

also by the accompanying œdymosis of the parts. Cases are recorded by Bowman, Curling, and others, in which this disease obtained enormous dimensions, but such examples are very rare, indeed, the affection is by no means common.

On the Source of the Blood.

A very common question with students is, as to the origin of the blood in these cases of hæmatocele, and in the spontaneous cases, and those following a strain or injury with an apparently sound testis, this question is difficult to answer. There can be little doubt, however, that a distinct rupture of some of the vessels, probably veins, which ramify upon the body of the testis, or on the tunica vaginalis, must take place.

When occurring upon a hydrocele, or after the operation of tapping, it is probably due to the distinct rupture or perforation of one of the large veins which ramify outside the tunica vaginalis, into its interior, or of one in the body of the testis.

Searpa relates a case of hæmatocele in which the spermatic artery was wounded, and Sir A. Cooper another in which a distinct rent in the tunica vaginalis was found on dissection. This latter condition is probably the most common.

Treatment.—The treatment of hæmorrhage into the tunica vaginalis testis, or cord, differs in no respect from the treatment of hæmorrhage into any other part of the body. In the very earliest period of its occurrence, rest in the horizontal posture, with the testicles well raised, and the application of cold lotion, are the most efficient means to arrest the flow of blood and relieve pain. By such means the blood may also be reabsorbed and all future mischief be prevented. Should the blood, however, remain fluid for a long time and no symptoms of reabsorption or of inflammatory action manifest themselves, it is probably a sound practice to draw off the fluid contents with a trocar and canula. In the following case this practice was adopted with good effect.

CASE 15.—*Hæmatocele cured by tapping.*—Thomas W—, æt. 21, came under my care at Guy's Hospital, on February 16th,

1865, with an epididymitis of the left testis, associated with a gonorrhœa. He called my attention at the same time to the condition of his right testicle, which was larger than the left, and of a very firm fibrous feel. It appeared that eight years previously he had received a severe injury to the right organ, which was followed at once by its rapid enlargement. He applied to a surgeon, who tapped the part, drawing off pure blood, and a rapid recovery took place, the testicle remaining, however, permanently enlarged, but in all other respects quite natural.

Should signs of inflammation appear soon after its occurrence, cold lotion and leeches, with the aid of saline purgatives, may occasionally be found efficient to arrest its progress, and to allow of the subsequent reabsorption of the effused blood. But should symptoms of suppuration show themselves, or of the softening down of the coagula, a free incision into the cyst or tunica vaginalis is the only sound practice, the whole semi-solid contents being thoroughly turned out, and the interior of the sac allowed to granulate.

In old and chronic cases, with thickened sac walls, the same treatment is also effectual.

I possess the records of many cases in which this practice was carried out with marked benefit: in one of only four months' duration, and in another of twenty-nine years, in which the tunica vaginalis was at least half an inch thick, and in both a good recovery followed as the result.

I need hardly add that excision is rarely called for in the treatment of these cases, although from difficulties in the diagnosis it may occasionally have been had recourse to. I have seen several instances in which the practice was followed on that account, and beyond the loss of the organ no evil resulted.

In old cases of hæmatocele, in old men, the practice of excision is probably the best—an example of which will be recorded—but in the young, and middle-aged, it cannot be advised.

The treatment of hæmatocele of the cord is to be conducted on similar principles.

CASE 16.—*Hæmatocele which broke down eighteen months after*

its first appearance. Sloughing of the scrotum and recovery.—William S—, æt. 31, came under my care at Guy's Hospital on February 9th, 1865, with an extensive ulceration of the scrotum and exposed testicle. The following is the history of the case.

Two years previously, when at work, he received an injury to his right testicle, which at once rapidly enlarged, and became the seat of severe pain. This soon, however, subsided, but the swelling remained. For about one and a half years the tumour underwent little or no alteration, and was hard and painless. At this time it began to cause uneasiness, and to undergo some change; the scrotum became inflamed, and glued to the testicle. The tumour also began to feel soft, and was evidently inflamed. An abscess formed, gradually enlarged, and three weeks before I saw him burst, many ounces of blood and matter escaping. When I saw him, there was a large sloughing sore occupying half the scrotum, which was adherent at its margins to the testicle. This gland appeared somewhat larger than natural, but was entire, and granulations existed upon its exposed fibrous covering. Under the influence of stimulating lotions and tonics the parts rapidly healed, and the surface of the testicle and the scrotum granulated healthily. The man soon passed from observation, apparently sound. On April 20th he was put down as cured, the testicle being fixed to the scrotum, but apparently healthy.

* CASE 17.—*Hydrocele of fifteen years' growth becoming a hæmatocele; excision of tumour.*—James S—, an Irish labourer, æt. 52, came under my care on February 26th, 1865, with an enormous tumour on the right side of his scrotum. It had been growing gradually for fifteen years, and had caused little or no pain, it had appeared without any known cause, but for the last six months its increase had been more rapid, this increase in size having immediately followed an injury he had sustained when at work. The tumour was evidently in the position of the right testicle, globular, and semi-fluctuating; it was smooth in outline, except posteriorly, where an apparent outgrowth existed, and felt firm and heavy; it was not painful on manipulation, although pressure posteriorly caused.

testicular pain. The scrotum was slightly œdematous, and the weight of the tumour caused much pain in the loins.

On April 25th, the man being under the influence of chloroform, I cut down upon the growth, exposing the tunica vaginalis. I then tapped the cyst, and drew off a quantity of thick fluid, like pea-soup, containing the elements of broken-down blood. The tunica vaginalis was much thickened, and was of cartilaginous hardness, its walls being studded with ossific deposits. The testicle was much enlarged and flattened out, being situated at the posterior part of the tumour, and corresponding to the outgrowth already mentioned. The whole tumour was then excised. The testicle was subsequently found to have been the seat of general tubercular disease. The tunica vaginalis had been enormously distended and thickened, and contained ossific matter in its walls. It seems probable that the original disease had been a hydrocele, and had become a hæmatocele after the injury. The disease of the testicle must be looked upon as accidental.

CASE 15.—*Hæmatocele as a result of tapping a hydrocele.*—An old man, æt. 66, who had been the subject of a hydrocele on the right side for sixteen years, and had been frequently tapped, applied to me on February 3rd, 1862, for renewed relief, and was passed into the hands of an experienced dresser for the purpose of being tapped. The tumour was large, and the testicle was naturally placed at the posterior and upper portion of the cyst. The operation was performed, and the fluid drawn off, a considerable quantity of blood following the clear fluid, and the puncture being accompanied with much pain, the patient stating at the time that the testicle was wounded. The man went home after the operation, and at night found the scrotum to be as large as ever, and somewhat painful. He kept quiet for three weeks, hoping all would be well, but finding the symptoms did not disappear, he again applied to me for advice, when he was at once admitted into the hospital.

The scrotum was much distended, with a large tumour of a pyriform shape, and smooth regular outline. It was indistinctly fluctuating, and somewhat tender on manipulation, particularly at its posterior part. There was some constitutional

disturbance, and an occasional rigor. In another week the signs of suppuration in the part were more marked, and as a result a free incision was made into the tumour, letting out a quantity of pus and broken-down blood; from that time everything progressed favorably, the man leaving the hospital in a month perfectly well.

CASE 19.—*Hæmatocele into the tunica vaginalis after an injury; rapid absorption of the blood.*—William F—, æt. 18, a healthy man, came under my care on June 8th, 1865, with an apparent enlargement of the right testicle, which had immediately followed an injury to the part four days previously. The tumour was globular, indistinctly fluctuating, and perfectly opaque; on manipulation the presence of the testicle could be made out by its special sensation towards the posterior part of the swelling, and there was evidence of ecchymosis in the scrotum. Some cold lotion was applied, and a saline purgative given. In one week the swelling had much subsided, and in a month the man was pronounced convalescent. There was, however, some slight enlargement of the part.

CASE 20.—*Hæmatocele of the cord.*—George S—, æt. 28, came to me at Guy's Hospital on July 20th, 1865, with a tense, globular, opaque swelling, the size of a goose-egg, in close apposition with the upper part of the testicle, but distinct from it. It had existed for twelve days, having been produced by a blow from a cricket-ball. The scrotum was also much ecchymosed, but the testicle was of its normal size. The swelling was painless, and evidently in the lower part of the cord, and was clearly a hæmatocele. Cold lotions were applied, and a mild aperient given; the swelling gradually diminished, and on August 18th it was not half its former size, and was very hard, absorption evidently going on satisfactorily, it was quite painless, and except from its mechanical inconvenience gave rise to no annoyance. The man is now under treatment.

CHAPTER LXIII.

ON INFLAMMATION OF THE TESTICLE.

Epididymitis.

UNDER the term *Orchitis*, most authors have been in the habit of including the inflammations of two distinct portions of the testicle, and of mixing up the symptoms of their several affections to the prevention of a sound and clear understanding of the subject. In the present paper I shall attempt, as far as I can, to separate the two, and to describe inflammation of the epididymis as one affection, and inflammation of the true secreting gland as another, calling the former epididymitis, and the latter orchitis. In certain cases, it is true, both structures are involved in the inflammatory action, and to this I shall apply the term *testitis*; the three words accurately indicating the true seat of the malady, and consequently tending to facilitate a better understanding of the subject.

All surgeons will be ready to admit the distinctness of these two parts, anatomically and physiologically, and it is as well also to acknowledge that pathologically they are constantly divided, for of this I am certain, that to the student of the affections of this organ, this division tends to clearness, and to a more ready appreciation of its several diseases.

As a preliminary to the more special clinical and pathological consideration of these diseases, the following observations of Mr. Paget, as given by Curling, upon the development of the epididymis and testis, may be read with interest and advantage.

Mr. Paget observes "that, in the normal course of human development, the proper genital organs are in either sex developed in two distinct pieces, namely, the part for the formation of the generative substance, the testicle or ovary, and the part for the conveyance of that substance out of the body, the seminal duct or ovi-duct. The testicle, or ovary, as the case may be (and in their earliest periods they cannot be distinguished) is formed on the inner concave side of the corpus Wolffianum, and

the seminal or ovi-duct, which is originally an isolated tube closed at both extremities, passes along the outer border of that body from the level of the formative organ above, to the cloaca or common sinus of the urinary, genital, and digestive systems below. The perfection of development is attained only by the conducting tube acquiring its just connections at once with the formative organ, and through the medium of the cloaca with the exterior of the body. The sexual character is first established when, in the male, the formative and conducting organs become connected by the development of intermediate tubes which constitute the epididymis; or when, in the female, a simple aperture is formed at the upper extremities of the conducting tube, and is placed closely adjacent to the formative organ. In both sexes alike the lower extremities of the conducting tubes first open into the common cloaca, and subsequently, when that cavity is partitioned into bladder and rectum, or bladder, vagina, and rectum, they acquire in each their just connections, and become, in the male, the perfect vasa deferentia, and, in the female, Fallopian tubes and uterus."

I will remind the student that the epididymis naturally forms the posterior part of the testicle, and the secreting portion, or true gland, the anterior; that the former in a perfect healthy state is only indistinctly felt, the vas deferens on being traced downwards from the cord, losing itself as it were in this part. The body of the gland is always to be made out by its smooth and elastic globular form.

SECTION I.

On Epididymitis, or Inflammation of the Seminal Duct.

Inflammation of the epididymis is almost always a consecutive affection, and occurs in association with a gonorrhœa, or as the result of some other irritation of the urethra, such as the presence of a calculus, or the passage of a sound or lithotrite. It generally comes on suddenly, and is accompanied with considerable pain, a marked enlargement of the epididymis, or posterior part of the testicle, forming its chief local symptom. It is a very painful affection, and is accompanied

with special tenderness of the part, this tenderness being readily traceable up the cord, which is occasionally swollen and œdematous; the inflammation being a direct extension from the urethra down the vas deferens to the epididymis—in fact, being an inflammation of the true seminal *duct*, and not of the seminal *gland*.

This enlargement of the epididymis is very rapid, and in some instances very great. It invariably assumes a special outline when uncomplicated, that is, when confined to this special part, the epididymis appearing of a boat- or truncated half-moon shape, holding the body of the testicle in its concavity. The lower portion of this body is usually the most enlarged, being composed of the greater number of the convolutions of the tubes, and consequently containing more cellular tissue, for it is from the infiltration of this cellular tissue around the inflamed seminal duct with inflammatory effusion, that this enlargement is produced.

This affection generally is an acute one, it comes on suddenly, and runs a rapid course, and is accompanied in most patients with some constitutional disturbance. In some subjects this is very severe, in others it is of a milder description, the sharpness of the inflammation, and the peculiarity of the patients, influencing the severity. It is characterised by the special symptoms already indicated, and its diagnosis is not, consequently, difficult.

It is at times, however, complicated with other conditions, such as an inflammation of the true secreting portion of the testicle, but this complication invariably occurs as a secondary symptom; and is produced by direct extension of the disease from the seminal duct to the seminal gland. I have never seen a genuine orchitis, or inflammation of the seminal gland, as a result of gonorrhœa, except as an extension of the inflammation from the epididymis, and it is in quite exceptional examples of this affection that the body of the testicle is ever involved.

When the gland itself is inflamed, the diagnosis is readily made, the enlargement and great tenderness of the part clearly indicating the affection. The whole organ presents an expanded but flattened aspect, the swelling of the epididymis posteriorly, and of the body of the testes anteriorly producing this peculiar

laterally flattened outline. The two inflamed parts will, however, be always felt distinct from each other, and can be readily diagnosed. There is, however, a second complication of epididymitis, which is more common than the one just described, and that is, the effusion of fluid into the tunica vaginalis, the production of an acute hydrocele, and I am disposed to think that it is this apparent swelling of the organ which has given rise to the mistaken idea that true testitis is a common affection after gonorrhœa, for an effusion into the tunica vaginalis is by no means an uncommon complication of epididymitis. The enlargement of the organ from such a condition is, however, very different from the enlargement already described as due to an inflamed gland; it is more globular, tense, and elastic; it is certainly equally painful with that affection, but its true nature can be readily made out by its translucency and by the presence of fluctuation on palpation. It is the result of a direct extension of the inflammation from the epididymis to the tunica vaginalis, and the following explanation of its occurrence by Gendrin, as given by Curling, with his assent to its soundness, seems most satisfactory, for it is certainly borne out by clinical observation. He says, "when the subserous cellular tissue, which always participates in the inflammation of a serous membrane, penetrates into the interior of an organ, it becomes a ready means of communicating the inflammatory action, but when the contiguous organ in subjacent parts is of a different structure from that of the cellular tissue, the extension of inflammation inwards is checked. Thus, in the case of the inflamed tunica vaginalis, the cellular tissue readily transmitted the morbid action to the epididymis, but the tunica albuginea arrested its progress to the body of the testicle, and this explains the fact, that after inflammation of the tunica vaginalis excited by injection, the body of the gland is rarely found to suffer. On the other hand, the epididymis is seldom attacked with inflammation without the disease being quickly propagated to the tunica vaginalis."

As the disease subsides in the epididymis the hydrocele, as a rule, disappears, it being exceptional for the latter condition to remain when its cause has been removed. As a consequence of this epididymitis, it is by no means uncommon for a con-

siderable thickening of the seminal ducts, and of their surrounding cellular tissue, to remain for many weeks or even months. In the majority of cases this result does not, however, take place, for in the healthy subject there is every reason to believe that with the inflammation all effusion disappears, and the organ is left as sound as it was before. In the cachectic patient this happy event does not, however, always take place, and more or less thickening of the inflamed part will generally be observed, the epididymis feeling indurated and enlarged, and in parts nodulated and cordy. It has been a disputed point by pathologists whether this condition ever leads to an atrophy or destruction of the testicles, or whether it has any influence upon the true function of the organ in causing sterility, and upon this point I have no positive facts to bring forward, but I have certainly seen a wasting of the glandular structure of the testicles after inflammation, the result of an epididymitis, and, in one instance, have witnessed an inflammation of the body of the testis in a young man who married with a marked induration of the epididymis, the result of an attack of inflammation some months previously, which I entirely attributed to the retained seminal secretion from the obstruction to the seminal duct, the result of the old epididymitis.

We know, also, that all ducts or canals are liable to obstruction or to stricture when surrounded by organized inflammatory products; and it is only right to believe that the spermatic ducts are obedient to the same law which governs others. This result may not, however, be very common, although it may certainly occur.

One word as to the side on which this epididymitis most frequently takes place, it having been generally asserted, on the dictum of Sir A. Cooper, that the left side is its most frequent seat. Mr. Curling, in his admirable treatise on the testes, tabulated the collected experience of many surgeons, and showed that in 138 cases of so-called consecutive orchitis, the right testis was the seat of the disease in 78 examples, the left in 49, and both glands in 11. My own figures bear out the truth of these conclusions, for of 73 examples of epididymitis 35 were of the right organ, 25 of the left, 4 were double, and in 9 the fact was not stated.

The right organ is, therefore, more often affected than the

left, but the reverse obtains in hydrocele, in which the *left* testis is the most frequent seat of disease.

I took some pains, during the eight years I registered the cases of gonorrhœa and discases of the testes, to find out whether the general opinion was correct, that the epididymitis usually appeared on the disappearance of the urethral discharge, and whether it was relieved on its re-appearance—whether it could be traced to any peculiarity in the treatment of the gonorrhœa, or to any neglect, or other cause; and I must confess that I have not been able to connect these phenomena in any way. For it appears that the epididymitis made its appearance during all stages of the complaint, and under every kind of condition, when injections were employed, and when they were not, when copaiba and cubebæ had been taken, and when they had not. That in some cases, certainly, the diminution of the discharge and appearance of the epididymitis were coincident it is quite true, but such a result is only consistent with the general rule, that an inflammation set up in one part tends to relieve an inflammation existing in another, and more particularly in a neighbouring tissue. It appeared in the majority of cases of neglected gonorrhœa, and in others in which strong injections had been recklessly employed, but more particularly in the cachectic and irregular living patients, who had been utterly regardless of their affection, and had taken no means to keep the testes well suspended; over-exercise and over-straining seemed, however, to be the most common cause.

Treatment of Epididymitis.

The treatment of this affection must depend upon the intensity of the inflammation, and the severity of the local and constitutional symptoms which it produces. Rest in the horizontal posture, with elevation of the testes or even of the pelvis, active purgatives, with saline medicines, combined in acute cases with tartar emetic, colchicum wine, and hot poppy fomentations to the part, are often sufficient to check the disease at its onset, and to prevent its passing into a chronic stage. A good opiate at night is also a wise measure to adopt. When the local symptoms, with pain, are very severe, leeches may be

applied to the neck of the tumour as the best place, or one of the turgid veins in the scrotum may be opened. The use of mercury in these cases, except as a purge, does not appear to be of much value, although it has the support of many experienced and trustworthy surgeons; personally I object to its use, as being unnecessary in the acute affection.

Should our patient, from social reasons, object, or be unable to keep at rest, the parts must be well supported by a suspensory bandage, or by a handkerchief folded crossways in a triangle, the apex of which is well braced up posteriorly by a piece of tape, or bandage, and the base attached firmly to a band brought round the waist, and the same treatment pursued as we have already indicated.

As a local application in the earliest stage of the disease, Mr. Curling speaks strongly in favour of ice; but not having employed it in this affection, I am unable to bear witness to its value.

The treatment by compression has also its advocates, who speak strongly of its advantages. In former times it was carried out by means of strapping; at the present day it is most efficiently performed by means of an india-rubber bag. Messrs. Hutchinson and Lee have been its chief advocates. It may certainly be used in some cases, but it must be well applied, for at the best it excites at first severe pain, which, however, soon disappears. I have used it but little in the acute affection, but in the more chronic or subacute stage of the disease, treatment by pressure is of great value.

In chronic epididymitis, when the disease has passed into an inactive stage, and little but the *product* of the inflammatory process remains behind, the treatment by pressure appears very valuable, indeed more so than any with which I am acquainted, for nothing more tends to hasten the absorption of the inflammatory product.

If mercury is ever needed in this affection, it is at this stage, for its power, doubtless, lies in its tendency to produce disintegration of tissue, and more particularly of the inflammatory products, for it is the organization and subsequent contraction of this inflammatory effusion in and around the spermatic ducts that produces the special evil effects of epididymitis. When I have had occasion to use it, I have done so as

an ointment applied to the part, with pressure, and have had good results from such a practice, but how far my success has been due to the pressure alone I am unable to say. Of late I have been accustomed to employ simple pressure in these cases, and have no reason to believe my success has been less favorable than it had been previously. Tonics have been administered freely in all these cases.

Should suppuration take place as a consequence of epididymitis, a result which occasionally happens, it is well to open the abscess early, and that pretty freely, for by such a practice the discharge finds easy vent, and a good recovery is more likely to occur, while the formation of sinuses is prevented. Water-dressing to the part, and the use of the suspensory bandage, is the best local treatment, but tonics and good living are also generally required.

CHAPTER LXIV.

ON ACUTE ORCHITIS, OR INFLAMMATION OF THE SEMINAL GLAND.

ORCHITIS or inflammation of the seminal gland for the most part occurs as an *acute* affection, as the result of an injury, but it appears at times spontaneously without any such cause, and more particularly in connection with parotiditis, or mumps. As already stated, it may be due to an extension of inflammation from the epididymis or spermatic duct, but it rarely, if ever, takes place as a primary affection in connection with gonorrhœa.

Acute orchitis may also attack the gland in its descent into the scrotum; an interesting example of which will be presently related.

As a *chronic* affection, it is the most common form of disease of the testes which is met with in practice, and as such it may take place as the secondary result of the acute disease, or as a consequence of some constitutional affection, such as gout, but more particularly of syphilis.

Acute Orchitis ; its Symptoms and Diagnosis.

The symptoms of acute orchitis are very marked, and its diagnosis is easy, for the rapid enlargement of the body of the gland, its flattened oval form, and extreme tenderness, are very characteristic. The patient will complain of its weight, and if standing, he will probably assume the bent posture. The disease will be accompanied by extreme local tenderness of a dull, aching character, and pain which passes up the loins, round the hips, and often down the thighs. The scrotum will probably manifest some symptoms of inflammation, as swelling, redness, heat, and increased vascularity.

The constitutional symptoms will vary according to the susceptibility of the subject of the disease, in some cases being very severe, in others less so. They will be those of general irritative fever.

In exceptional examples of this acute affection there will be some effusion of fluid into the tunica vaginalis, but this complication is not so common after acute orchitis as after epididymitis, for reasons which have been already given.

As a rule, it may also be asserted that acute orchitis tends towards recovery, and seldom terminates in suppuration, unless it be of the tubercular form, or affecting very cachectic patients. In one known example it ended in gangrene of the part, the case having been recorded by the late Mr. Harvey Ludlow, in his unpublished Jacksonian prize essay. The case was under the care of Mr. Stanley, who was induced to cut into the gland, from the severity and obstinate character of the pain, and a black gangrenous cavity was exposed, which was seen after death to have occupied half the organ. I have the records of a case in which the patient stated that one testicle sloughed out after inflammation six months previously: the man came under treatment for inflammation of the other. The termination by suppuration, however, occasionally takes place, and numerous are the examples of this condition which I possess; they may at times end favorably, the abscess healing without any evil result, but too frequently the discharge of the abscess ends in what has been variously described as benign fungus of the testis, or

granular swelling, or hernia testis, the latter being the most correct and intelligible name, the affection being the result of rupture or ulceration of the tunica albuginea, and the gradual extrusion or hernia of the tubuli of the gland, the extruded gland being covered with granulations: the true nature of this affection was first described by Mr. Lawrence in 1808.¹

Acute orchitis as a consequence of parotiditis or mumps is a well-recognised affection, although it may be difficult to explain the connection between the two diseases; it is described by some surgeons as a kind of metastasis, but there are no published facts tending to support this view; no one, however, is disposed to deny that the one affection occurs in connection with the other. The disease is not usually very severe, and it commonly passes away with little treatment, leaving the testicle generally sound, few cases being recorded of atrophy of the glands attributable to this disease. The symptoms are precisely similar to those already described, and need no further illustration.

Treatment of Acute Orchitis.

The ordinary principles of treatment which are applicable to local inflammations in general are to be acted on in the treatment of this affection. Rest in the horizontal posture, with elevation of the parts and warm fomentations, are essential points for observation; leeching to the groin or local venesection, and saline purgatives with sedatives being the chief remedies. The disease has a tendency by itself to get well, and unless badly treated, or neglected, or attacking very cachectic subjects, this result will generally be attained. In extremely severe examples, where the inflammation runs high, tartar emetic in full doses is a most valuable drug; and colchicum, in half drachm doses of the wine, with saline purgatives, often acts like a charm. Opium in full doses may also be given where pain is severe and constitutional disturbance great. An acute attack, however, generally runs its course in about ten days, and seldom ends otherwise than well.

CASE 21.—*Rapid descent of the testicle from the abdomen;*

¹ 'Edinburgh Med. and Surg. Journal,' vol. iv, p. 257.

inflammation of the gland when passing down the inguinal canal.

—Robert H—, æt. 12, was brought to me at Guy's Hospital on June 20th, 1859, under the following circumstances :

The *right* testicle was not to be felt, having evidently not descended from the abdomen. The *left* had put in its first appearance at the external ring three days before his application to me, the boy having experienced pain in the groin, extending upwards towards the loin for two weeks previously. On walking into the room, it was at once observed that his body was bent unusually forwards, and that his movement was much restrained. On examination the testicle was readily felt in the left groin, having passed down the canal, and partially through the external ring. The gland was of a large size, remarkably tender, and was about the size of an egg. The horizontal posture was ordered to be maintained, with the thigh flexed, and cold lotion or ice applied. In three days the symptoms had somewhat abated, and at the end of the week the swelling was much less. On July 11th, or the twenty-first day after coming under observation, the testicle had passed the external ring, although resting close to it in the scrotum. In another week all pain had subsided; the testis was free, and the patient disappeared from observation, being quite well.

CHAPTER LXV.

ON CHRONIC ORCHITIS.

OF the true diseases of the seminal gland chronic inflammation is the most common; and this is sometimes a consequence of the acute affection, often the result of an injury, but most frequently induced by some special constitutional condition, such as gout, tuberculosis, and more particularly syphilis.

The symptoms of chronic orchitis, when depending on the majority of these causes, are much alike; they differ only in some minor although important points; in the inflammation due to the syphilitic virus the symptoms are some-

what peculiar, and, as the diagnosis of the affection is important, it will receive at our hands a special consideration.

The subject will consequently be divided for consideration into the ordinary forms of chronic orchitis and syphilitic orchitis.

Symptoms and diagnosis of Chronic Orchitis.

The most special point in the natural history of chronic orchitis is its insidiousness; it comes on, unless following an acute attack, as a rule, so unmarked by any special symptoms, and unaccompanied by any pain, that in certain examples it is only by the increased size of the gland that the patient is induced to seek advice. In other cases, however, this swelling is accompanied by pain of a dull and aching character. In the early stage of the disease the gland may be more or less painful on manipulation, but in a more advanced condition, or in a very chronic case, no local pain will be experienced, even on somewhat rough manipulation, and in these examples even the ordinary testicular sensation will fail to be excited on firm pressure. The general appearance, also, of the testicle, the subject of this affection, is somewhat peculiar; it is not pyriform or globular, as in hydrocele and many other affections of the gland, but it has a peculiar flattened outline from side to side and a smooth even surface—unless the disease be associated with some effusion into the tunica vaginalis—when the tumour will naturally assume more the shape of a vaginal hydrocele. But the simple affection is rarely associated with such a complication, and when it is the fluid is, as a rule, secreted in very small quantities.

The epididymis, in exceptional examples, may be slightly enlarged and thickened, from the extension of the inflammation to its tissue; but when this does take place it will rarely be to any great extent.

There are seldom, also, any constitutional symptoms worthy of remark, except in cachectic and irritable patients, when the dull aching pain of the part will generally give rise to some general irritability of the patient's condition, and an anxious expression of countenance.

The Pathology.

The pathology of this affection is not difficult to understand, for it is precisely similar to that of any chronic inflammation of any other part. It consists of a more or less general infiltration of the gland with an organizable or organized material, this material separating the secreting tubuli and acting on them in different ways, according to the amount of fibrin poured out between them and the amount of pressure to which they are subjected. In some cases the inflammatory product is diffused very generally between the tubuli, in others it is deposited in irregular masses, but when the material poured out is very great, and is equally diffused between the meshes of the testis, that is, when the disease is extensive or of long standing, that condition of gland is probably produced which is indicated by an utter absence of the natural sensation of the organ on handling or on firm pressure, and in this stage short of the breaking up of tissue, there is the greatest anxiety for the subsequent maintenance of the integrity of the organ. Should the disease make a favorable progress towards recovery, and this inflammatory product be re-absorbed, the pressure will be proportionately removed from the delicate tubuli of the organ, and with this condition the natural testicular sensation will be restored—a point which should always be looked for in the treatment of these cases being one of great value, and indicative of recovery.

Should the inflammatory product soften down, as it will in the delicate and cachectic subject, suppuration will take place, and in proportion to its extent will the liability to a *hernia testis* be manifested.

And again, should this inflammatory product proceed to a more permanent organization, and contract, the delicate tubuli of the testicle will necessarily suffer in proportion to the extent of the part involved, and an atrophy of the organ will, as a consequence, be the result.

All these results are met with in practice to various degrees, and in greater or less frequency, the general condition of the patient having a more important influence in determining the

result than anything else, even more so than the treatment which may have been adopted; but I may add that there are few affections which are more amenable to good treatment than the one now under consideration.

When the disease is remarkably insidious in its advance, slow in its progress, and painless in its character; when the patient is cachectic and irritable, with an anxious countenance, disposition to a hot skin, and other symptoms of constitutional irritation; and, more particularly, when the disease ends in suppuration, as it in all probability will when coming on and progressing in the manner just indicated, it is reasonable to believe that the organ has been the subject of *tubercular mischief*, and that the inflammation of the part has been the means of hastening the disorganization of the testes; but it must be added that in these cases the tubercular affection is probably of the infiltrating or miliary tubercular form, and not of that crude nature which runs a different course, and to which attention will subsequently be directed.

In gouty inflammations of the organ the symptoms are not, as a rule, so chronic as they are in the former class of cases to which we have just alluded. Indeed they may more rationally be described as being of a subacute nature, for although generally coming on slowly, they are manifested with greater local tenderness and pain; the pain will also at certain periods be considerably aggravated, and most probably this will be at night. The disease has also a strong tendency towards recovery and not towards disorganization. Besides these symptoms, others indicating a gouty disposition will probably be present, an acidity of stomach, a loaded condition of the urine, and a more or less distinct history of gout. There will also be frequent nocturnal pains in the opposite testicle, of a darting character, leading the patient to fear a double attack, and when these pains occur they are valuable as diagnostic symptoms, in connection with others.

Cases of Inflammation and Suppuration of the Testicle.

CASE 22.—*Suppuration of the testis of an infant.*—Edwin A—, æt. 6 weeks, was brought to me on February 12th, 1862, with an abscess of the body of the right testis, which had been dis-

charging for one day. The symptoms had existed but one week previously. There was no history, or external evidence of an injury. Water dressing was applied, and on March 10th the child had recovered.

I looked upon this case as caused by an injury, probably a puncture by a pin, for it ran its course so rapidly, and was so unlike any idiopathic disease.

CASE 23.—*Inflammation of both testes ; suppuration of one ; recovery.*—John S—, æt. 29, came to me on July 25th, 1863, with disease of the right testis of two years' standing, and of the left of some days. The right had suppurated one year previously, and had been discharging ever since, the abscess evidently having connection with the centre of the gland. The organ was uniformly enlarged, about the size of an orange, and was almost painless. Tonics alone were given, the man's health being very bad, and fomentations were applied to the part. Under this treatment all swelling subsided, the abscess healed, and in two months he was discharged well.

CASE 24.—*Inflammation of the testicle, the result of an injury ; suppuration of the gland, and recovery.*—Samuel H—, æt. 25, applied to me, at Guy's Hospital, on January 5th, 1865, with an abscess in his left testicle of three days' duration, following a chronic enlargement of the organ of eight months' standing, produced by a blow. By tonics and water dressing to the part, which was well kept up, convalescence took place after one month's treatment.

Cases of Simple Chronic Orchitis.

CASE 25.—*Double orchitis without known cause.—Second attack two years subsequently ; recovery.*—Charles D—, a policeman, æt. 35, came to me at Guy's Hospital, on May 6th, 1861, with inflammation of both testicles, of five weeks' standing. It came on without any known cause. There was no evidence or history of syphilis. The testes were much enlarged, and appeared as smooth, even, and elastic tumours, flattened somewhat laterally. They were the subject of a dull aching pain, which was increased by manipulation. The man's health was

good. He was ordered to keep the parts well up by means of a bandage, and one grain of the iodide of mercury was given twice a day. On July 16th he was declared to be cured. He remained well till February 26th, 1863, the testicles appearing quite sound during the interval, when the right suddenly began to enlarge, and, as this continued for three weeks, he again sought my advice. The same treatment was adopted as had proved of value on the former occasion, and with speedy success, convalescence being established in three weeks.

CASE 26.—*Chronic inflammation of the testicle with hydrocele—Three unsuccessful attempts to cure the latter by injection; recovery by treatment.*—Peter D—, æt. 28, came to me on February 4th, 1865, with a large hydrocele of the left side, and chronic inflammation of the left testicle, of three or four years' standing. He had been tapped, and the hydrocele injected three times without benefit—once three and a half years ago, again on Dec. 7th, 1863, and for the third time on January 16th, 1864. There was no history of syphilis. I drew off the fluid from the tunica vaginalis, and found the testicle much enlarged, but with a smooth and regular outline—it was painless, and quite free from the natural testicular sensation on manipulation. Iodide of potassium, in three grain doses, was given three times a day, and one grain of the iodide of mercury every night. Under this treatment the disease gradually subsided. The hydrocele, which at first reformed, gradually disappeared, and on April 10th, two months after his application to me, he was pronounced well.

Symptoms and Diagnosis of Syphilitic Orchitis.

That syphilitic inflammatory disease attacks the testicle as it may any other gland or texture of the body, whether within or without, seems a tolerably well-recognised pathological fact at the present day, and to my colleague Dr. Wilks is due the credit of bringing this subject clearly before the profession. It remains for us now to compare our clinical observation with pathological knowledge, and to point out such symptoms as may aid in the recognition of syphilitic inflammation as affecting the seminal gland tissue.

But before doing so it may be well briefly to consider in what way syphilitic inflammation differs from others, as it will tend to help us in the special application of the subject to the local affection; and fortunately, for brevity, the points of difference are neither numerous nor deeply seated. The main one to which I shall allude is palpable and apparent, even to the most casual observer, for it is readily seen that in all syphilitic inflammations there is a marked tendency to the deposition of a product which rapidly undergoes fibrous changes, and tends to infiltrate the part affected with an organizable or organized material of a dense, firm, and fibrous structure. We see this in every tissue and in every stage of the disease. We see it manifesting itself primarily in the true infecting chancre by its almost cartilaginous hardness of base. We see it in the early constitutional symptoms of syphilis, in the different eruptions, and in the greater permanency of their skin staining; in the different affections of the mucous membranes in all their parts; in the inflammations of the eye, cellular tissue, periosteum, and bone. The pathologist sees it in the many changes found after death in the internal organs of the syphilitic subject; and the surgeon sees it, likewise, in the inflammation of the testes. For we find that in the syphilitic patient the testicle may at some period of the disease, and generally at a late one, become the seat of a syphilitic inflammation, which manifests all the peculiarities of this pathological condition. The affection is essentially a chronic one, as much so as in the other forms of chronic orchitis, but it is almost invariably confined to the body of the gland, and but rarely affects the spermatic duct. It is quite painless in its nature, locally and generally, the patient bearing free manipulation without flinching, and often thinking little about his disease, except from the increased size of the organ. The special sensation of the gland usually disappears at a very early stage of the disease, and there is rarely any constitutional disturbance accompanying its progress. It may or may not be associated with other symptoms of constitutional syphilis, but it usually appears alone.

The disease manifests itself locally in a special manner which claims attention. It usually affects both testes at dif-

ferent periods of its progress—rarely, however, both at the same time, and the body of the testis is the part involved. It is almost always complicated by the presence of a vaginal hydrocele, and this at times increases to a considerable size—much more so than in other forms of chronic orchitis. But the most characteristic point of all is the remarkably stony induration of the part and the peculiar irregularity of the outline of the gland, the surface of the swelling being very nodular, in some cases small fibrous projections from the body of the gland are distinctly visible, and in some, loose bodies are felt in the tunica vaginalis.

The diagnosis of this disease is not consequently difficult, for the symptoms are somewhat peculiar.

In the majority of cases the disease terminates by resolution; and apparently leaves the gland intact; but in many a gradual wasting of the testicle is the result, which terminates in atrophy and, as a consequence, in sterility. In exceptional cases suppuration may take place with or without the hernia testis.

The disease, when apparently cured, has a remarkable disposition to return on the slightest provocation, even to many times, and this was well seen in a case which I shall relate.

In the Guy's Museum are several specimens illustrating this affection, and more particularly the fibrous degeneration or atrophy, to which allusion has been made.

On the Treatment of Chronic Orchitis.

There are few affections more amenable to treatment than chronic orchitis, particularly when taken early; and there are none which better prove the value of pressure and mercurials in procuring the absorption and disintegration of inflammatory products. In the common orchitis as well as in the syphilitic this opinion holds good; but, in the gouty, the treatment must be modified according to the special peculiarity of the patient. In a healthy subject, with good powers and an unbroken constitution, any form of mercurial may be administered, such as blue pill in four grain doses, or mercurial inunction, or the bi-chloride; but as the object of the surgeon is not to salivate, nor to bring the patient rapidly under

the influence of the remedy, but rather to procure a lengthened and equal action of the drug upon the local disease, the dose is required to be carefully regulated. In my hands the iodide of mercury given in one grain doses, with five of Dover's powder, twice a day, has proved eminently beneficial, the testicle being well strapped up by common soap plaster.

In a more cachectic patient, in whom mercury may still be tolerated, the same treatment may be employed although in smaller doses; and in others the mercurial may be locally applied in the form of an ointment, with strapping over. During this time tonics, as quinine and iron, may be administered, and good living and fresh air enjoined.

In certain examples, however, occurring in cachectic patients, it may not seem desirable to administer mercurials in any shape, and under such circumstances iodine may be substituted in the form of the iodide of potassium, in three or four grain doses, combined with half drachm doses of the syrup of the iodide of iron in infusion of quassia, three times a day. Locally, strapping, or rather pressure, should still be enforced. In hospital practice this treatment has been of great value. By such treatment, steadily persevered in for six or eight weeks, even the worst of cases may be expected to yield, the organ gradually becoming softer and more natural in sensation and shape, and at last resuming its normal condition.

In the gouty form of orchitis, which is to be recognised or suspected by the symptoms already quoted, the administration of colchicum acts very beneficially. It is to be given in small doses, and continued for several weeks. The acetic extract in half grain doses, with Dover's powder, is the best form, and with it a cure may generally be guaranteed. This form of disease is tolerably easily reduced when early recognised. It is more liable, however, to relapses, but less so than other forms to disorganization and subsequent atrophy.

Should there be sudden accessions of pain in the part, with other evidences of some fresh inflammatory attack, the application of a few leeches with hot fomentations is very serviceable, but these conditions are not common.

When vaginal hydrocele coexists with the inflamed gland,—frequent complication of the syphilitic variety,—it is a good practice to draw off the fluid, for it enables the surgeon to apply

his pressure with more certainty and better effect; but it is of no use to attempt to cure the hydrocele itself, for it is to be remembered that the hydrocele is the direct consequence of the diseased testis, and that it is of little use treating the effect of a diseased condition and not its cause. Remove the latter, and the former will probably disappear. Cure the orchitis, and the hydrocele will generally go.

I have the records of a case which passed under my care for treatment, in which by some oversight this attempt had been made, and the hydrocele was tapped and injected with iodine on three different occasions, without success. Under the treatment adopted the chronic orchitis disappeared, and with it the hydrocele.

It is not always desirable, nor is it possible in a large proportion of cases, to keep the patient absolutely at rest during the process of treatment. In some examples it is advisable to do so as much as possible, particularly when the patient experiences more pain and inconvenience when walking or about, but in the majority of cases it is sufficient to keep the parts well supported in an elastic bandage, when strapping is not employed, and when it is, the same result is secured.

In the consideration of the treatment of this chronic orchitis it has been stated that a good recovery may generally be secured by the means which have been suggested, when the disease has been taken in hand at an early period of its existence; that is, when not more than five or six weeks have been allowed to elapse.

But in cases of longer standing the prognosis is not so favorable, neither as regards the removal of the disease, nor the subsequent integrity of the part as a seminal gland, and these remarks more particularly apply to the syphilitic form of the affection. For, in these cases of long standing, the fibrinous matter has generally become too well organized for future absorption, and, when this is the case, the subsequent contraction of the organized product will almost to a certainty go on to the destruction of the semiferous tubuli, and the production of an atrophy of the gland. In the Guy's Hospital Museum are several admirable specimens exhibiting this result.

In certain examples, again, of the chronic orchitis, whether

syphilitic or otherwise, suppuration and disintegration of the gland structure will take place. It may be suspected when the disease is of a very torpid character, when the pain is of a constant aching kind, and when all treatment fails to influence its course.

When it does take place, an early evacuation of the matter is the best practice, for a clean incision or puncture into the part often seems to prevent that destruction of the glandular structure, and of the fibrous covering of the gland, which usually precedes that troublesome affection, hernia testis.

Cases of Syphilitic Orchitis.

CASE 27.—*Congenital syphilitic orchitis, with "snuffles."*—Thomas M—, æt. 6 months, came under my care at Guy's Hospital, on February 4th, 1861, for syphilitic snuffles, the disease having appeared a few days after birth. At the time of birth, however, it was observed that both testicles were somewhat enlarged, and as they steadily increased in size, the mother drew my attention to the fact. I found the bodies of both glands unusually large, the right being about the size of a shelled, and the left of an unshelled almond. They were firm and smooth, and could be manipulated without pain.

The child otherwise appeared healthy. No history of syphilis could be obtained from the mother, who was a respectable woman; the characteristic snuffles, however, seemed sufficient to indicate the nature of the case. Grey powder was given twice a day, with tonics. After a month's treatment the snuffles had disappeared, the right testis suppurated and recovered, the left gradually subsided, and in May the case was reported as cured.

CASE 28.—*Congenital syphilitic disease of the testicle.*—T. P—, æt. 16 months, came under my care in September, 1863, with condylomata at the mouth, arms, and margin of prepuce. The right testicle was the size of a large almond, the left, apparently of its normal size, was situated at the internal ring. The disease of the testicle had existed from birth, the condylomata for fourteen months having gradually become worse.

The infant was the first child of a syphilitic father.

One grain of grey powder was given twice a day, and the child gradually recovered.

CASE 29.—*Syphilitic orchitis ; two distinct attacks at an interval of three years.*—James G—, æt. 30, came under my care in March, 1861, with chronic orchitis of the left testicle, of one year's standing. He had had a chancre, followed by sore throat and eruption, one year previously, for which he had been salivated. The testicle was very hard and nodulated, and perfectly painless even on free manipulation. On May 16th, the right testicle showed evidence of the same disease ; it was smaller than the left, and like it painless. The man had been out of my observation for several weeks, his work having called him away from town. His general health was not good. I had both organs strapped up with leather strapping. Ordered quinine three times a day, with one grain of the iodide of mercury every night. In one month the testicles had recovered their normal shape and sensation, and the man was declared well. In August 3rd, 1864, three years after this convalescence, he came to me with the same disease in the left testicle, which presented the same aspect as it did when first diseased. Under the quinine and iodide of mercury and strapping, it soon recovered. On November 20th, 1864, I saw this man, and he was quite well. Testicle natural.

CASE 30.—*Syphilitic orchitis sixteen years after chancre, and wasting of left testicle ; right orchitis complicated with hydrocele ; unsuccessful treatment of the latter by iodine injection ; cured by treatment.*—Ralph McM—, æt. 46, came under my care on November 2nd, 1862, with a large hydrocele of the right testis, and an irregular, nodular, painless enlargement of the organ. He had had a chancre and eruption sixteen years previously, for which he had been salivated ; nine years after this he had chronic inflammation of the left testis, which had subsequently wasted, and, when seen, it was a small fibrous mass, not half the size of the natural organ.

The right testicle had enlarged for eight months, and was complicated with hydrocele. He had been under the care of

a surgeon, who had tapped and injected the hydrocele five months previously without any benefit.

I tapped the hydrocele, and then felt the peculiar characteristic fibrous nodular enlargement of the testis. The organ was then strapped up, and a grain of the iodide of mercury given twice a day.

In five weeks a recovery was secured.

CASE 31.—*Hydrotestitis following a chancre after eight years ; cure by treatment.*—Edward S—, æt. 26, applied to me for advice on January 11th, 1864, with hydrotestitis of the left gland, of four months' standing. He had had a chancre eight years previously, and skin eruption, for which he was salivated, and he remained well till the present disease appeared. The hydrocele was tapped, and testicle strapped. The iodide of mercury was given twice, and iodide of potassium with the iodide of iron three times a day. In one week he was salivated slightly, and the pill was then given every other night. In a month he was declared to be cured.

CASE 32.—*Syphilitic orchitis ; failure of treatment by mercurial ointment locally applied ; recovery by other means.*—William P—, æt. 26, came to me at Guy's on January 26th, 1865, with syphilitic orchitis of the right testicle, of four months' standing. He had been salivated for a chancre and eruption six years previously, having remained well up to four months since. He had been under care at another place, and had had his testicle strapped up for three months, with mercurial ointment, without the slightest benefit. I gave him the iodide of mercury twice a day in a pill, and had the testicle firmly strapped up. In two months he was cured.

CASE 33.—*Syphilitic orchitis with hydrocele two years after chancre and eruption ; cure.*—Henry P—, æt. 22, came under my care on December 7th, 1863, with chronic orchitis and hydrocele on the right side, of ten months' duration. He had had a chancre two years previously, with eruption, but had never taken mercury. The tumour was very tense, but quite painless. The fluid was drawn off, and the indurated testis

readily detected ; it was very hard and nodular, the body being covered with small fibrous projections. The natural testicular sensation was altogether absent, free manipulation causing no pain. Strapping was applied, and the iodide of mercury given in one grain doses twice a day. Quinine was also ordered, as the man's general condition was far from good. In six weeks he was reported cured.

CHAPTER LXVI.

ON TUBERCULAR DISEASE OF THE TESTICLE.

TUBERCULAR disease of the testicle may attack any part of the organ, that is, either the seminal gland or its duct. It may affect either of these parts separately or together.

It may show itself either in the form of an infiltration of the so-called miliary tubercles, or in the more distinct and usual condition of the yellow, cheesy, unorganizable material described as crude tubercle.

When appearing in the form of miliary tubercle, it is not characterised by any very definite symptoms : indeed, the infiltration of a gland with those small, gray miliary bodies seldom makes itself known by any visible signs, and it is to be suspected only when a rapid disorganization of the part takes place, after an attack of acute or chronic inflammation. For organs thus infiltrated have no power of resisting the inflammatory process, and, whether it be a lung or a testicle which is the seat of this affection, active breaking up of tissue generally takes place, with suppuration. We will therefore exclude from our present consideration those interesting cases. Pathologically, they are clearly to be recognised ; but practically, they are only to be suspected when the result takes place to which I have already alluded.

The other form, however, of tubercular testis is characterised by more special symptoms and local conditions. It may

involve, as already stated, either the body of the gland or the epididymis, but, without doubt, the latter is its most frequent seat.

It is discovered, as a rule, accidentally by the patient, and frequently not until some secondary change in the structure is about to show itself.

It appears primarily as an indolent, painless enlargement of the epididymis, and is described usually by the patient as a lump in the testicle, this lump appearing generally at the upper part. This symptom being, in all probability, the only one to which attention can be drawn; the surgeon will recognise it at once on manipulation, for the tubercular matter will feel as if some foreign body, as a pea, bean, or nut had been placed between the convolutions of the epididymis, or in the substance of the gland. It is not painful on pressure, nor in the inactive stage does it seem to cause any injurious influence on the organ, which is otherwise natural in its sensation and function.

In other cases it will appear as a general infiltration of the part involved. Should this be the epididymis, the part will be materially enlarged, indurated, and nodular, painless perhaps, and inactive, the body of the testes resting on the concavity of the affected portion, apparently sound. Should the body of the gland be the part affected, like symptoms will be present, the enlargement, however, showing itself in the secreting structure as an unequal and nodulated expansion of the part; the epididymis, or seminal duct, being quite distinct.

This inactivity of the disease does not, however, remain for ever—it may last months, or even years—but the time will come, in all probability, when the tubercular matter will begin to soften down, and thus excite some increased action in the parts around. It may be that it will be this increased action in the part which first draws the patient's attention to his affection, when the history of some previous thickening of the organ will be for the first time obtained.

When inflammatory symptoms are once developed, the disease will surely make rapid progress, and disintegration of this unorganizable tubercular matter will speedily follow, accompanied with suppuration.

In tubercular epididymitis—for such this disease may be named—local suppuration will soon appear, with the discharge of ill-formed pus and the *débris* of this tubercular material, showing itself as a curdy, friable, and granular material; sinuses are apt subsequently to form, which may go on discharging for a variable period, this point depending on the extent of the disease, and the amount of foreign material there is to disintegrate and soften down.

Should the body of the testicle be the part implicated, the same gradual softening down and suppuration will take place, and, too often, the formation of the hernia testis to which allusion has been already made. It is not, however, in every case of this disease of the testis that disintegration of the tubercular material is to be expected, with its accompanying suppuration and abscess, for in many examples no such result is to be found, this tubercular matter undergoing a gradual change, and showing itself after death as an earthy concretion. We see the same changes in the absorbent glands, in the lungs, and in other parts.

This tubercular disease of the testes may occur at any age, but seldom before adult life. The best example I have, however, ever seen was in a child aged two and a half years, whose testicle I excised in October, 1858, for tubercular disease of six months' standing; it had progressed very slowly, and had obtained a large size before suppuration occurred. Convalescence followed the operation, but the child subsequently died of general tuberculosis. The specimen is in the Guy's Museum, 2351⁷². The whole organ is nearly filled with serofulous deposit, and the epididymis likewise. It is in this organ that we have the best opportunity of examining the true tubercular disease in its different stages, and of watching the various forms of its deposition, its changes, and its decay.

Treatment of the Tubercular Disease of the Testicle.

When tubercular material has been once deposited in a testicle, as in any other tissue, there are no recognised means by which the absorption of this material can be procured. It is true that it may remain, for an indefinite period, in an inactive or passive condition, and finally, by undergoing an

earthy degeneration, cease to trouble; nevertheless, it will still exist, ready, as it were, on the least disturbance, to light up some inflammatory action in the tissues around, and give rise to any or all of the various conditions just described.

Looking also upon the deposition of tubercle in a testicle as only one of the local manifestations of that general condition described as tuberculosis, and well illustrated in the case of the child already quoted, whose testicle I excised, it is clear that the principles of treatment should be of a general character to improve the health, and revive the powers of the patient by tonics; good living, good air, regular habits, and, what is of great importance, total abstinence from sexual excitement or gratification. Beyond that nothing can be done. Locally, the parts should be maintained as much as possible in a quiet condition, and cold sponging night and morning is of some service.

When inflammatory symptoms make their appearance, they will generally run their course, in spite of treatment; for, as already shown, they are usually caused by the breaking down of the tubercular deposit, and may be looked upon as one of nature's means for its elimination, and until this material has, consequently, been discharged, their subsidence is not usually to be looked for; fomentations in this stage are, therefore, suitable, and the application of water-dressing to the part, and support in a suspensory bandage, should be employed. When suppuration is nigh at hand, or has manifested itself, it is good practice to open the abscess freely with a lancet, for it saves time, and pain to the patient, and often prevents the formation of the sinuses which prove so troublesome. During all this time the health of the patient should be attended to by ordinary measures.

When the gland has attained large size, and is evidently destroyed by abscesses and disintegration of the infiltrating material, it may be excised, and more particularly if the hernia testis has appeared. Still the surgeon should not be in any hurry to operate in these cases, for the subjects of this affection being tuberculous, are not favorable to operate upon, and castration should consequently be only performed where a strong necessity exists, and the disorganized testes are a source of trouble and weakness to an enfeebled patient.

CHAPTER LXVII.

ON HERNIA TESTIS.

THIS affection of the testis, which has been variously described as “granular swelling” and “benign fungus of the testis,” has also more correctly been called *hernia testis*, for it is essentially a gradual protrusion of the substance of the gland through a rupture or ulceration of its fibrous envelope, the tunica albuginea. It may follow upon suppuration of the body of the gland, the result of an injury, or of an acute or chronic orchitis, or from the softening down of tubercular deposit. It seems to be the result of pressure, produced by the natural elasticity of the fibrous tunica albuginea, the testicle as it were being gradually squeezed out of its capsule and everted, the mass being eventually increased by the free granulations which spring up on its surface. The whole organ, or only a portion of it, may be thus extruded from its natural position, the extent varying according to the amount of disease and the size of the opening in the tunica albuginea and integuments. It must not be supposed, however, that this *hernia testis* is the necessary consequence of suppuration, or of disorganization of any portion of the gland, for such is not the case; in the majority of instances this result does not ensue, still in the minority it is certainly found, and in such requires consideration.

The diagnosis of the affection is not difficult, and being once seen, should be subsequently readily made out. It is a peculiar fungating-looking growth, with everted edges, and with a sinus in its centre generally secreting pus; it may be of variable extent, and also present a more or less irregular surface, and on examining its base, it will be seen to be in a measure pedunculated, the pedicle passing through an opening in the scrotum to the remains of the testicle. The margins of the opening in the scrotum will be seen to be generally free, although in some cases adherent to the growth. It may be slightly indurated from inflammatory thickening, but will never present the same aspect as a cancerous growth, for

which this affection may be mistaken, the term fungous testis having doubtless been the means of encouraging the great error of regarding this simple disease as a malignant one. The natural sensation of the gland remains, however, in those cases, and will be readily excited on manipulation. In cancerous disease no such natural sensation exists, and in doubtful cases this point is one of primary importance.

Treatment of Hernia Testis.

It may be safely stated that the majority of cases of hernia testis can be successfully treated by other less severe measures than castration—an operation which has been very generally performed for this affection by surgeons of the past generation. In exceptional instances it may be demanded, and I have the records of some eight or ten cases in which it has been successfully performed. The surgeon's object, it may be briefly stated, is to restore the extruded testicle to its natural place, and this may frequently be done by simple pressure, applied by fixing a good firm pad over the surface of the growth, and drawing well forward the margins of the ulcerated scrotum, fixing the whole in position by good strapping. In other cases, where the granulations are very exuberant, caustics may be used to hasten their destruction; and amongst the best is the old remedy of the red oxide of mercury, pressure being well maintained during its use. All minor cases, and many severe ones, may certainly be cured by these means, if steadily pursued and well applied. In the more obstinate and severe examples other measures must be adopted. The excision of the surface of the growth was formerly employed, and is now at times in the present day, but the practice, at the best, is a very doubtful one, for in the majority of cases to which it is applicable it would be tantamount to castration, as the fungating mass is as a rule composed of the everted tubules of the testes, covered with granulations, and consequently by this measure the tubules would be cut off and the gland destroyed.

Mr. Syme has described, however, in the 'London and Edinburgh Monthly Journal' for January, 1845, a plan of treatment which in these cases is very serviceable, although I

would add that it is only in quite exceptional examples that it can be called for. The operation consists in the elevation of the margin of the serotum from the protruding mass, the reduction of the hernia testis within the serotum, and the retention of the part in its natural position by a careful stitching together of the margins of the wound in the divided serotum, careful bandaging and strapping being also required in the treatment of these cases. The granulating organ subsequently becomes attached to the inner surface of the serotum, and a healthy action is subsequently restored. It is almost needless to add, that local and constitutional treatment for the original affection of the testis should be maintained at the same time.

CHAPTER LXVIII.

ON CYSTIC DISEASE OF THE TESTICLE.

THERE is no disease of the testicle upon the nature of which there has been a greater difference of opinion than the cystic disease, and, although modern pathologists have devoted considerable attention to its investigation, the subject has not yet been brought out of its obscurity and made plain to the profession.

SIR A. Cooper, one of its original describers, looked upon it as a distinct disease of the secreting *tubuli* of the organ, and upon his authority this view was for a time generally received. But more recently, Mr. Curling's researches have tended to prove it to be an affection of the *ducts* of the testicle, and not of its secreting tubuli. "Why they alone," says Mr. Curling, "are subject to the morbid change, I admit my inability to explain." Whether this opinion be correct or not will be one of the subjects for present consideration; for I am disposed to think that it is not quite consistent with observed facts, although there can be no doubt that the rete-testis appears to be the seat of the disease in certain cases; while in exceptional examples cystic disease is undoubtedly formed independent of this structure.

It has been my privilege to examine many examples of this rare affection with some care, and in the main points of Mr. Curling's investigations I entirely concur, although I am not so sure of the special seat of the disease as he appears to be.

The disease is doubtless made up of cysts which are multilocular and of various sizes, from that of a mustard seed to a moderate-sized nut. These cysts are filled with a thin, serous blood-stained, or glairy fluid, and at times they contain intra-cystic growths more or less pedunculated, made up of a delicate cellular structure, or of a distinct cell tissue. These cysts appear to be embedded in a fibrous stroma, of different degrees of consistency and density—in some instances the fibrous elements being much more numerous than in others. In some it will be of a delicate nature, and more allied to the fibre structure found in the ordinary fibro-plastic growths of other parts. In certain examples the cysts appear to be clearly made up of dilated tubes, pouches appearing at their extremities or as lateral dilatations, these tubes being occasionally lined, as Mr. Curling was the first to state, with tessellated epithelium, and containing granular matter. I have failed, however, to find this in all the cases I have examined, and am disposed to look upon the presence of this tessellated epithelium as specially characterising a certain growth. Spermatozoa are invariably absent in the cysts or tubes of this affection. Enchondroma or bony material will almost always be found to exist; in some examples as small isolated patches, in others the cyst will be filled with such a material, and under such circumstances the growth might be described as an enchondromatous tumour, the cartilage being deposited in separate masses, these masses being divided by a fibrous stroma. The true secreting portion of the testicle will often be found pushed up into some corner of the tumour, or spread out over the cystic mass, or distributed between the cysts themselves, the tumour being invariably encysted in its own capsule; and, in rare cases, tumours of this nature will be found upon the cord and body of the testicle. The above facts, therefore, lead me to believe that the majority of these are new growths, following the great law which governs the development of all tumours, and partake of the nature of the

part in which they are developed, being more or less made up of the elements which naturally enter into its formation. The testis being essentially a tubular organ, all morbid growths developed in or near it have a tendency to assume a tubular or cystic character, this character varying in extent in different cases; the cystic or tubular, and fibrous or fibro-plastic elements being found in different degrees of perfection and quantity in different cases.

We may thus find in the testicles a tumour presenting all the elements of the fibrous or fibro-plastic tumour without cysts, whilst in another the same elements will exist in less proportions, the cystic formation more or less predominating; and in the majority of these examples the true structure of the testicle will be found spread out to a variable extent over the special capsule of the new growth. In other cases the new growth will be altogether free from any connection with the testis itself, and will be found growing from the cord. All these separate kinds of tumours, examples of which may be seen in the Guy's Museum, appear to me merely modifications of one kind of growth—the simple, or perhaps more correctly, adenoid growth of the testis. I am not prepared to say there is no true cystic disease of the rete testis, for I believe such an affection to exist, and am disposed to think that it may be pathologically recognised by the presence of the tessellated epithelium which is occasionally found within the cyst, or dilated tube, as originally described by Mr. Curling. I have seen this structure in one example, which was clearly situated in the position of the rete testis, with the testis spread out over it, but although I have looked for it in others, I have failed to find it. In a case related by Mr. Athol Johnson, in the 'Pathological Society's Transactions,' the same epithelium was found to line a cyst which was without doubt connected with the secreting tubuli. I would look upon this fact as consequently diagnostic between the two.

We thus see a close analogy between these tumours of the testes and others of the mammary gland, as well as of the ovary. We find in both the simple adenoid tumour, partaking more or less of the nature of the gland in which it is developed; and we find a true cystic disease of the gland itself, the latter being evidently a special affection of the tubes and

ducts of the mammary gland or testis, and not of the secreting structure; in both organs they are new growths, simulating, more or less correctly, the anatomical structure of the true gland.

Symptoms and Diagnosis.

Having dwelt as long as space will allow upon the special pathology of these interesting diseases, I will pass on to consider it in its clinical aspect, and to point out the symptoms which indicate its presence, and may help us to the formation of a correct diagnosis; and in doing so, I must premise that the development of the several forms of this cystic disease is to be recognised more by negative than positive signs, for they appear usually as painless enlargements of the organ; they are of slow growth, and unaccompanied by any symptoms such as attract attention, the patient seldom seeking advice until the organ from its size has become troublesome, or the dragging pain in the loins—which always exists when the testicle has become large and heavy from any cause—excites anxiety. The organ soon loses its natural shape, and assumes more the oval or pyriform outline of a vaginal hydrocele or hæmatocele. It will probably have a smooth and equal surface, and will be indistinctly fluctuating; it will not, however, be translucent. The natural sensation of the testis will not be experienced on manipulation, the absence of this natural condition appearing at a very early stage of the disease. The general health of the patient will probably be good, and there will be no evidence of any secondary glandular affection. The disease may generally be recognised by these conditions; the history of the case, the opacity of the tumour, and the loss of the natural testicular sensation, distinguishing it from hydrocele and hæmatocele; and when doubt exists, an exploratory function by the trocar and canula will decide the point, for in cystic disease a little bloody and glairy fluid will alone escape. From the inflammatory affections they may be diagnosed by the difference in the shape and feel of the tumour, for in the different forms of orchitis the organ maintains its flattened form from side to side, feeling hard, nodulated, and tender. In the cystic disease the tumour is generally more or less globular or pyriform, feeling smooth, elastic, and senseless.

The inflammatory affections are also often associated with a hydrocele, the cystic but rarely, if ever. In the former, also, both organs are generally affected sooner or later; in the latter, the disease only attacks one. Medical treatment does not appear to have any influence in arresting the development of the cystic disease, whilst in the inflammatory a good recovery may generally be secured by the use of proper remedies.

Treatment of the Cystic Disease.

There is but one remedy for this affection, and that is the removal of the diseased organ. No remedies seem to have the slightest effect in diminishing its size or arresting its growth; and excision should consequently be performed, the operation being, as a rule, most successful.

CHAPTER LXIX.

ON CANCER OF THE TESTICLE.

THE testicle, like all glands, may become the seat of cancerous disease, both of the carcinoma-fibrosus or hard cancer, and of the carcinoma-medullare or soft cancer. It is rare, however, for the hard cancer to attack the testes, the majority of examples of cancer being of the soft or encephaloid kind. For one example of the hard cancer it is probable that at least twenty of the soft are met with in practice. In the different museums a few specimens may be seen of the former kind, and at Guy's several exist.

Cancer may attack this organ, likewise, in two forms—either as the tuberosus cancer or the infiltrating. In the former class the disease appears either as an isolated growth, or as several distinct tumours separating the parts—then eventually coalescing into one mass. In the latter it appears from the beginning as the infiltrating kind, being more equally distributed between the tubes and ducts of the true secreting gland tissue.

This disease has one peculiarity which is worthy of notice, and that is the tendency there is in the malignant as in the simple affection of the organ to be accompanied by the

development of cysts, these cysts in the cancerous disease being filled with cancerous matter, in lieu of the glairy mucous or fibro-cellular intra-cystic growths which are found in the fibro-plastic, adenoid, or cystic diseases. In rare examples both conditions seem to coexist in the same organ; simple cysts, with the clear or blood-stained glairy fluid, existing in one portion, whilst in others these cysts are filled with cancerous material, and in a third, enchondromatous masses may at times be present.

The body of the gland is the part of the organ generally attacked, although the epididymis may be the seat of the disease; but when the latter is involved it is as a rule an extension of the disease from the body of the tumour—rare examples, however, existing which illustrate the primary affection of the epididymis. Cancer may occur at all ages, cases being related, by different authors, of this disease attacking infants even so young as seven months; and I have excised a cancerous testicle from a boy only two years old. The history of the case will be subsequently given.

Cancer may attack the testes of the old as well as of the young, and I have the records of cases occurring in men aged 56 and 62, respectively. The majority of cases occur, however, in young adult life, from 25 to 40.

I possess the records of sixteen cases, and I purpose to add them to the fifty-one examples originally tabulated by Mr. Harvey Ludlow, in his prize essay. The results are as follows:

Before the age of 5	.	.	.	6 cases.
From 15 to 20	.	.	.	2 "
„ 20 to 30	.	.	.	16 "
„ 30 to 40	.	.	.	27 "
„ 40 to 50	.	.	.	8 "
„ 50 to 70	.	.	.	8 "
				<hr/>
				67 "

Out of my 16 cases the disease had been growing for one year or less in 11, and in the remaining 5 cases three, three, four, four, and five years respectively.

It is rare, if not unknown, for both testicles to be the seat of cancer at the same time; I am not aware of any such example being on record. In 10 out of the 16 cases before me the right organ was attacked, in 6 the left.

Symptoms and Diagnosis of Cancer of the Testicle.

Cancer of the testicle may come on as insidiously as the simple cystic disease, but in general its growth is more rapid. It makes its appearance as a gradual enlargement of the body of the organ, and is seldom attended by any pain. There is also an early loss of the special testicular sensation on pressure or manipulation. The outline of the tumour is also smooth, semi-elastic, and fluctuating, although as the disease progresses its surface may become somewhat uneven or irregularly bossy, the tumour being harder in some parts than in others, the softer parts projecting. In the carcinoma-fibrosus, however, the whole tumour is hard and at times nodular.

It is very rare for the disease to progress sufficiently far for the skin and fibrous tunics to ulcerate, and for a bleeding fungus to form; the tumour must be very large for such a result to take place. The integuments are generally also free from the beginning—the disease being confined within its fibrous coverings. As the disease progresses and the health of the patient suffers, a general aspect may appear, indicative of exhaustion and some wasting disease, although it is not till a late period of this affection that any such symptoms are to be expected. There may be also more or less lumbar pain; when a constant aching exists, a suspicion of enlarged lumbar glands should be excited, and in certain examples these may be felt travelling upwards along the psoas muscle.

The inguinal glands are also occasionally enlarged from evident infiltration. It is believed by some surgeons that this complication does not appear till the scrotum is involved in the disease, but this is certainly not the case, for enlarged inguinal glands may appear at an early stage. It is the size of the organ which generally first draws the attention of the patient to the part, and the pain and inconvenience caused by its weight, which prompt him to seek advice.

The tumour is also opaque from the beginning, and is rarely, if ever, associated with any hydrocele—when it is, it is by a chance, the one affection having no direct relation to the other. In this respect it differs from the ordinary inflamma-

tions of the organ, such affections being very frequently complicated by the presence of a hydrocele.

The diagnosis of this disease is by no means easy, particularly in its early stage—indeed in many instances it is almost impossible to be certain.

The history of the case and the absence of translucency will prevent its being mistaken for a hydrocele. The hæmatocele has also a distinct and special history of its own, and the fact that the testis may be made out to exist in some portion of the tumour is a material aid to the surgeon in forming a correct opinion as to the nature of the case.

The tenderness of the organ, the nature of the pain, and shape of the swelling, are sufficient to indicate the inflammatory affection, and when fluid exists the diagnosis is rendered more plain, for a vaginal hydrocele rarely coexists with any other disease than the inflammatory, except to a very slight extent.

The simple cystic disease is of slower growth than the cancerous, and generally firmer to the feel; when punctured it yields also a glairy fluid, unlike the creamy material which comes away from the cancerous disease.

The subject of diagnosis, however, of all these growths will be discussed in a separate chapter.

Treatment.—The only treatment which gives any comfort to the patient is excision of the organ; it should be done, however, as early as the diagnosis can be made, for there is then less chance of the glands in the loin, &c., becoming involved. The general health must also be looked to with great care at the same time.

Medullary Cancer of the Testicle of a Child one year and a half old.

CASE 34.—A child, æt. 2, was brought to me at Guy's Hospital, in February, 1860, with a disease of the right testicle, of six months' growth. It had appeared gradually, and the enlargement was very slow for four months, when it increased very rapidly. The tumour was painless even on pressure; it was the size of a small egg, smooth in its outline and semi-clastic. The child's health was good. On April 3rd I removed the gland, and a speedy recovery took place.

The child remained well for nearly two years, when a return

of the growth appeared at the original seat of the disease; for three months this grew gradually, and when I saw him the tumour was about the size of a walnut, globular, smooth, and occupying the same position as the original testicle—it was fairly moveable and gave rise to no pain. No secondary enlargement of the glands could be detected. On August 6th, 1862, I excised the growth, but found a narrow neck of the disease dipping downwards into the perinæum, which could not be removed. The wound healed kindly, but the perineal tumour speedily increased to an enormous size, nearly that of the child's head, and in November, 1862, when I last saw the patient, he was evidently sinking from cancerous infiltration of the lumbar glands.

The tumour, on removal, was a splendid example of the medullary cancer, as it attacks the glandular portion of the testis. It seemed to have infiltrated the gland, no signs of the true structure of the organ remaining.

Medullary Cancer of the Testicle of rapid growth; excision and recovery.

CASE 35.—Henry R—, æt. 41, was admitted into Guy's Hospital, under my care, on April 3, 1861, with a disease of left testicle, of four months' standing. He was a strong, healthy-looking man, and a ship's carpenter by trade. He had always enjoyed excellent health up to four months before his admission, when he observed, without any known cause, some slight enlargement of the left testicle. The enlargement rapidly continued, and, when seen, the tumour was as large as a good-sized cocoanut—it was quite painless, and the natural sensation of the organ, on being pressed, had entirely disappeared. The growth was tense, smooth, and semi-elastic; it was very freely supplied with blood, large tortuous veins filling the serotum. The inguinal and abdominal glands appeared healthy.

I tapped the growth with an exploring trocar and canula, blood freely flowing, and subsequently a little serum, but no glairy fluid as found in the cystic disease. Excision was subsequently performed, the whole cord being firmly ligatured. A good recovery ensued.

On making a section of the tumour it was found that the

disease had occupied the body of the gland, and no remains of healthy tissue were to be seen; it was clearly a good example of the infiltrating medullary cancer of the gland, containing here and there some small patches of effused blood.

It may be remarked that, during the operation, a small cyst was opened in the anterior part of the tumour, apparently developed in the tunica albuginea.

CHAPTER LXX.

ON THE DIAGNOSIS OF A SCROTAL TUMOUR.

IN the following chapter I propose to consider the subject of diagnosis of scrotal tumours as a whole, to describe the train of thought as it passes through the surgeon's mind in his attempt to diagnose a tumour of the testis, and to point out the special symptoms, or their combination, as they tend to indicate the presence of any special affection. Fully recognising the great difficulty so frequently experienced in forming a positive opinion as to the nature of a scrotal tumour, I believe that a near approximation to truth may generally be made when the history of the case, and its special symptoms, are carefully weighed, and I am not disposed to place amongst the impossible the diagnosis of a scrotal tumour, because occasionally great difficulty may be experienced, or it may be beyond our power to form any positive opinion upon the point. There are gradations of probability in all our conclusions as to the diagnosis of any disease, a certainty untainted by fallacy or doubt, rarely being obtained, and, I take it, we are as often correct in our judgment of the scrotal tumour as we are of any other affection.

The first point the surgeon has to decide, on being consulted as to the nature of a scrotal tumour, has reference to the question of hernia. Is the tumour connected with the testicle? or has it passed down the direction of the cord from the abdominal cavity? Should the surgeon be able to isolate the growth at its neck from the abdominal cavity by the

thumb and finger, the question is at once decided,* for almost all scrotal tumours can be so isolated, it being quite exceptional for any to pass up the cord so far as the internal ring; rare cases of vaginal hydrocele, or hæmatocele, in which the tunica vaginalis is open up to the internal ring, forming the exception.

This important preliminary point having been decided, the nature of the growth claims our attention next.

Is it a hydrocele or hæmatocele? Is it the product of inflammation or of tubercular disease? Is it a new growth altogether, and if so, is it innocent in its nature or malignant?

Should the tumour prove translucent by transmitted light, the existence of a hydrocele may fairly be decided, although the form of this affection may yet be doubtful. Is it an ordinary vaginal hydrocele, or is it encysted? Should the tumour be large, even, and pyriform, and should the testis be found, either by means of manipulation or by the opacity displayed at one spot on transmitting light—at the posterior part of the tumour—vaginal hydrocele may be suspected; but should the testis exist in front or at one side, and should the tumour be small and have been of very slow growth, and should it be more or less globular or evidently multilocular, a cystic hydrocele may probably be diagnosed. The tapping of the tumour will, however, settle the diagnosis; for in vaginal hydrocele the fluid will be more or less straw-coloured and albuminous; in the encysted it will be thin, non-albuminous, pale, and probably opalescent, containing on microscopical examination granules and spermatozoa.

The presence of hydrocele is thus readily decided in the majority of cases, but in rare or old instances the tumour is at times opaque, thus complicating the diagnosis. The history of these cases will, however, tend to throw much light upon the point, for it will to a certainty reveal a disease of very long standing; the tumour will be probably painless and fluctuating, and the testis will be made out in its usual position at the posterior part of the sac. Should a doubt exist, a puncture with an exploring trocar and canula will decide the question, for in those cases fluid will be drawn off of a dark colour, loaded with cholesterine.

We will now pass on to the consideration of tumours which

are not translucent, and not hydrocele, and it is here that the surgeon experiences true difficulty in his diagnosis, for almost all the diseases of the testis are insidious in their growth, and most are painless in their development. The hæmatocele usually follows upon some strain or injury, and increases with tolerable rapidity up to a point, this change being accompanied with pain which soon subsides; it then becomes stationary as to size, and remains torpid for a variable period, when pain again appears, with other signs of inflammation. The presence of the testis is also to be made out by manipulation towards the posterior part of the organ. The surface of the tumour is always smooth, more or less oval or pyriform, and semi-elastic or fluctuating.

The inflammatory affections of the testis have a peculiar shape, being laterally flattened; they are usually accompanied at some period of their course with tenderness and pain, and often associated with fluid in the tunica vaginalis. In the syphilitic inflammation this fluid is often copious. Both organs are also generally involved, either together or at different times. The tumour is usually somewhat tender to the touch, and has a firm fibrous feel, unlike the semi-elastic and half-fluctuating sensations given by cystic or carcinomatous disease. In very chronic cases the testis may, however, be perfectly painless, and will allow of any amount of manipulation without distress; the natural testicular sensation will also have disappeared. In syphilitic disease the surface of the tumour will probably be irregular, with firm fibrous outgrowths in different parts and in the tunica albuginea.

In the tubercular affection of the epididymis or testis there should not be any difficulty in the diagnosis, for the tubercular deposit, as a rule, takes place unaccompanied with any pain, or any symptom beyond that produced by its deposition. When deposited in masses,—its usual manner,—it feels like some foreign body introduced into the body of the gland or of the epididymis; it is at first quite painless and unproductive of any symptoms, these only appearing when the material begins to soften down, and excite some inflammatory action in the parts around. This tubercular material may be deposited in one or more masses, subsequently, perhaps, coalescing into an

irregular induration. When suppuration takes place, the diagnosis is complete.

The cystic or simple tumours of the testis are painless from the beginning, painless as growths, as well as on manipulation, and are to be recognised by purely negative symptoms. They attract the patient's observation only from their size; can be handled without exciting pain, and are usually free from even the natural sensation of the organ upon pressure. They are slow in their growth, uniform in their outline, and more or less globular; are always confined to one gland, rarely accompanied with fluid in the tunica vaginalis, and on being punctured, emit only a more or less blood-stained glairy mucus.

The cancerous tumours of the organ are more rapid in their development than the cystic, a year's growth, as a rule, giving a large tumour; they are likewise painless, and readily allow of free manipulation. The natural sensation of the organ also soon disappears. They are unaccompanied with a hydrocele, and also involve only one organ. They have a more elastic and fluctuating feel than the cystic and the inflammatory enlargements, and when their outline is unequal or bossy, the projection is generally softer than the other portion of the tumour. An exploring needle, or trocar and canula, rarely, if ever, reveals the mucoid fluid so characteristic of the cystic or simple affections, but usually lets out blood or the thin creamy fluid so characteristic of a cancer. In the following table the chief points of difference in the several chronic affections of the testicle are clearly shown. I sketched it years since for my own purpose, and having found it useful, think it probable others may do the same in its improved condition.

Table of Diagnosis of Chronic

Symptoms.	Hydrocele.	Hæmatocele.	Chronic Orchitis.
Condition of tumour	Tense, usually transparent, fluctuating	Tense and elastic; <i>not</i> transparent; <i>obscure</i> fluctuation	Firm, and not elastic; <i>not</i> transparent; <i>not</i> fluctuating unless complicated with hydrocele
Outline	Smooth and uniform	Smooth and uniform	Smooth and compressed laterally
Position of testis	Posteriorly in <i>vaginal</i> . In front, or at side, or below in <i>encysted</i>	Posteriorly	Evidently an enlarged testis
Testicular sensation	Present on manipulation	Present on manipulation	Present at first; absent after long existence of disease
Rapidity of growth	Gradual, most so in <i>encysted</i>	As a rule sudden, and after accident, at times spontaneous	Slow
Size	To great dimensions in <i>vaginal</i> ; moderate in <i>encysted</i>	Moderate	Rarely more than three or four times natural size
Form	Pyriform or oval in <i>vaginal</i> ; globular in <i>encysted</i>	Pyriform, or oval	Oval with flattened sides
Pain	Very slight, if any, except when complicated with inflamed testis, and in acute hydrocele. Not increased on pressure	Painful at first, and at a later stage; not so during the intermediate	Dull pain, increased on pressure, except in very chronic disease
Manipular indications	Like fluid, vibrates on palpation	Firm and solid	Firm and solid, unless associated with hydrocele

Disease of the Testicles.

Syphilitic Orchitis.	Tubercular Disease.	Cystic, or Adenoid disease.	Carcinomatous Disease.
Very solid, but not elastic or transparent unless complicated with hydrocele, which is very general	Indolent indurations in body of gland or epididymis, like foreign bodies. Towards the end these bodies soften and excite suppuration	Firm and elastic; insidious enlargement of gland; not translucent; indistinct fluctuation	A tense and firm enlargement of body of testis; not translucent. Indistinct fluctuation towards later stage; bossy outline; parts softer than others.
Irregularly nodular and very hard	The epididymis the most frequently involved	Generally regular, smooth, and elastic; rarely bossy	
In tumour	In natural position often half surrounded by epididymis as a half crescent	In tumour	In tumour.
Absent altogether, except in very early stage; returns also towards convalescence	Present	Present at first, but soon lost	Soon disappears.
Slow in the extreme, often hardly noticed	Slow at first; rapid afterwards, when softening and inflamed	<i>Unequal</i> ; slow at first, more rapid afterwards	Rapid, as a rule; slow only in the carcinoma fibrosum, which is very rare.
Moderate	Moderate	Rarely, but sometimes very large	Sometimes very large.
Irregularly oval and lumpy	Lumpy; uneven in all its stages	Oval with flattened sides. Smooth at first, subsequently bossy	Globular or pyriform. Smooth at first, subsequently lumpy, softest at these points.
Very slight, allows rough handling. Towards end of disease, on recovery, pain on pressure returns	Very slight pain or tenderness, except when pressed hard or inflamed	Slight when present; generally painless even on manipulation	Very slight even on free manipulation.
Very hard and irregular outline. Often hydrocele with small fibrous bodies in tunica albuginea	<i>At first</i> as if foreign bodies existed in the parts, lumpy. <i>At last</i> soft before suppuration	Firm and elastic, more so in one spot than another	Firm but elastic; softer on the bosses, when present.

Table of Diagnosis of Chronic

Symptoms.	Hydrocele.	Hematocoele.	Chronic Orchitis.
Seat of its commencement	In <i>vaginal</i> , at the lower part of the tumour. In <i>encysted</i> , at the upper	—	Evidently in body of gland
Cause	No recognised cause	An injury or strain, rarely spontaneous	Injury; or idiopathic
Progress	Has a tendency to remain tranquil, and not to inflame, unless injured	Has tendency to inflame and suppurate, and not to remain tranquil for long	Slow growth; rarely, but at times ends in suppuration
Condition of cord	Free and healthy	Healthy	Often full and tender on manipulation
Results of tapping, exploratory or otherwise	Straw-coloured, serous fluid in <i>vaginal</i> ; limpid, opalescent in <i>encysted</i>	Blood fresh, or broken up with pus	—
Condition of inguinal and abdominal glands	Free and healthy	Healthy	Healthy
Complications	Inflamed testicle	None, unless hydrocele, or injured testicle	Occasionally with hydrocele
Organs involved	Occasionally double	Never double	Generally both organs, either separately or together

Disease of the Testicle.—Continued.

Syphilitic Orchitis.	Tubercular Disease.	Cystic, or Ædenoid Disease.	Carcinomatous Disease.
Always in body of gland	Generally in epididymis ; occasionally in body of gland	In body of gland	Body of gland.
Constitutional syphilis, hereditary or acquired	Tuberculosis	Unknown	Unknown ; occasionally on injury.
Essentially chronic ; rarely terminates by suppuration	Very indolent and insidious ; tends to inflame and suppurate after an uncertain period	Unequal ; never inflamed	Rapid as a rule ; rarely slow.
Free	Healthy	Healthy	Full ; veins enlarged.
—	—	<i>Mucoid fluid</i> , more or less blood-stained	<i>Blood or creamy fluid</i> , with characteristic cell-growth on microscopical examination.
Generally indurated	Generally indurated	Rarely involved	Generally involved.
Hydrocele, almost always. Othersyphilitic affections	Rarely with hydrocele. Disease in other parts of body	Rarely with hydrocele	Cancer on other parts ; rarely with hydrocele.
Often both organs	Both organs, as a rule, involved	Always single	Single as a rule.

ON
VESICO- AND RECTO-VAGINAL FISTULÆ,
AND
RUPTURED PERINÆUM, &c.

IN the following paper I propose to make a few remarks on the subjects of vesico-vaginal and recto-vaginal fistula ; to note down the principal practical points the observance of which are essential for success in such operations ; and to demonstrate by the short record of typical cases the best means for their performance. I shall also illustrate in the same way the surgical treatment of ruptured perinæum, both simple and complicated, and, I trust, prove satisfactorily that the most severe examples of these affections are capable of repair, and that surgery has its triumph in this department of practice no less than in others.

CHAPTER LXXI.

ON VESICO-VAGINAL AND RECTO-VAGINAL FISTULA.

It is neither necessary for me to enlarge on the causes of these affections, nor to dwell on the miseries which such conditions entail on the unfortunate women who are their subjects.

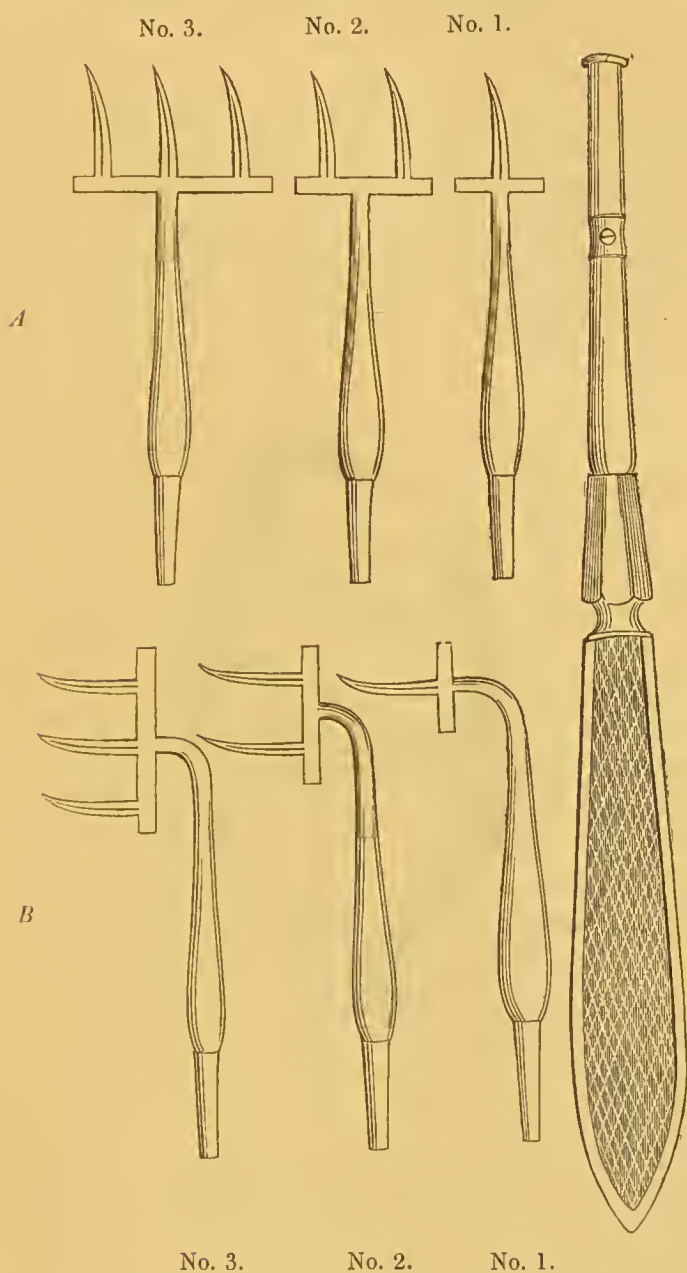
The latter are too well recognised by all people ; and, as a surgeon, it is satisfactory to be able to prove that in the majority of, if not in all, such cases relief can be afforded, if not complete restoration to the normal condition.

In the treatment of recto- or vesico-vaginal fistula there are two chief objects which the surgeon has in view.

First, to pare with nicety and accuracy the whole margin of the fistula ; and, *secondly*, to bring into, and to maintain in, close apposition the raw and incised surfaces. If these two ends be secured, the means by which they are attained are comparatively of small importance, although their simplicity is a point of considerable value. The chief difficulties of the operation are, it is allowed, generally met with in carrying out the first object we have mentioned, and its ultimate success most unquestionably depends upon the mode in which this step has been performed ; for, however well the second step in the operation may be executed, failure must ensue if the first has not been fairly accomplished. The hope and aim of the surgeon in these cases is to secure union of the pared edges of the fistula by primary adhesion, and to obtain this result two clean and even surfaces must be placed and kept in apposition. Surgeons who have attempted to pare a fistulous opening, situated either on the surface of the body or in the vagina, well know what care is demanded to prevent any irregularity or raggedness of the wound's surface, and they well know that if this irregularity exists, primary adhesion of the edges cannot take place. It is this difficulty which, I believe, too often necessitates the repeated operations we hear of for the cure of a vaginal fistula ; and it was to obviate such that I was led some four years since to the construction of the instruments which are illustrated below (modifications of that formed by Mr. Hillyard, of Glasgow), and which subsequent experience has fully proved to be of great value. I have reason to know that in other hands as well as in my own they have been equally serviceable, and that they have tended to facilitate the performance of a difficult operation, and render it more certain and satisfactory.

The advantages which are gained by the use of the instrument, are, *first*, the certainty with which the whole margin of

the fistula is incised; and, *secondly*, the accuracy with which the width, length, and evenness of the incision is secured.

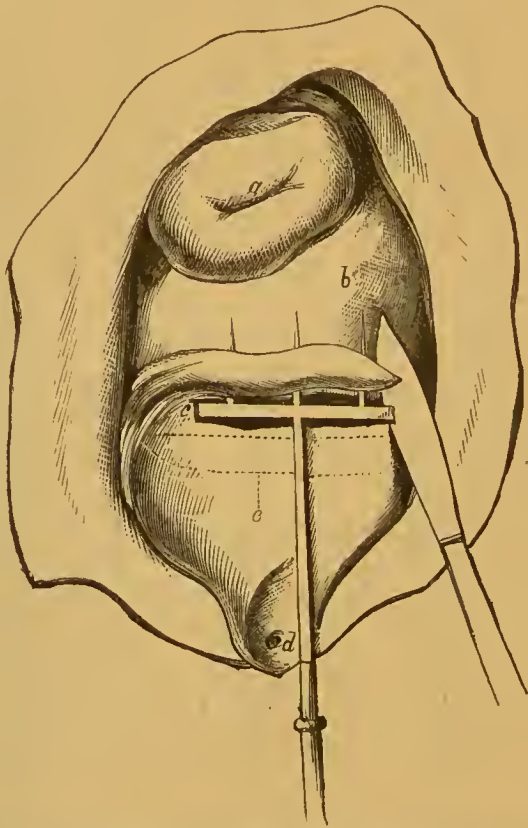


No. 3. No. 2. No. 1.
A. No. 1, 2, 3, Guides for transverse fistulæ. *B.* Guides for vertical fistulæ.

The following are the directions for its application :

Assuming that an operation for vesico-vaginal fistula is to be performed, and that the fistulous opening is an inch long,

the guide with three prongs (No. 3 A or B) should be selected, its width being sufficient to include the whole upper margin of the opening. The extent of surface to be pared should then be mapped out with a scalpel, a third or half an inch of raw surface being desirable when it can be obtained, and the prongs of the guide inserted at the edge of but not through the mucous membrane of the bladder, and passed *between* the tissues, beneath the vaginal mucous membrane to the required extent; the ends of the prongs should then be made to perforate the mucous lining of the vagina, at the line of incision already made by the scalpel, and with a blunt hook



View of vesico-vaginal fistula with pronged guide introduced, and knife with which the upper margin is to be incised.

a The os uteri.

b The anterior wall of the vagina.

c The fistula, with the mucous membrane of its upper margin perforated by the No. 3 guide, preparatory to its removal.

d The urethral orifice.

e portion of mucous membrane mapped out for removal.

The body of the patient is supposed to be turned over two thirds on to the abdomen.

the tissues thus included should be well pressed down to the prongs' base; the whole of this surface thus raised by the guide is then to be excised by one sweep of the scalpel, passed along close to the posterior margin of the instrument.

By this means the cleanness of the wound is guaranteed, and its extent accurately determined, not the slightest fingering or chance of causing any irregularity in the wound's surface is experienced; indeed, with the exception of the subsequent introduction of the needle, no instrument need touch the surface of the wound a second time. The lower margin of the fistula should then be treated in the same manner as the upper, thus completing the first and most important step of the operation.

The second step of the operation remains to be described, and although it may be equal in importance to the first, it is not one of difficulty, yet at the same time it requires some nicety in execution. The object is to bring the raw surfaces of the fistula into close apposition, and to maintain them there. This is to be carried out by means of sutures, the wire being the most convenient. The sutures should be sufficiently close to ensure the accomplishment of the object for which they are introduced, and may be fastened in any way which the operator prefers. The perforated shot applied to the twisted end of the wire answers every purpose, both fixing the wires and protecting their points. There is one point, however, of essential importance to be remembered in this the second step of the operation, and that is the distance at which the sutures are to be inserted from the margin of the wound; as a rule, the greater the distance the greater the advantage to be gained—a third, or half an inch or more being desirable. The edges of the wound are not to be adapted too tightly, for swelling will occur, and, as a result, ulceration in the line of suture is sure to follow. This point is as essential in all plastic operations as in the one we are now considering.

The sutures may be left in for six or eight days or more; but I believe it best to remove them as soon as the wound is healed, no good object being obtained by leaving them longer, and in some cases ulceration may be set up, which may interfere with, if not mar, the ultimate success.

The urine should be drawn off periodically after the ope-

ration, but it is not necessary to irritate the bladder by retaining the catheter in it.

A good opiate suppository should be given to relieve pain or local spasm, and perfect cleanliness is to be enforced during the treatment.

To illustrate the practice I have just briefly sketched the following cases may be related. The first two have been already published in a short paper printed in the 'Transactions of the Medical Society of London,' for 1861, but as they were amongst the first in which I employed my new instruments, I have taken the liberty of republishing them in the present form.

CASE 1. *Vesico-vaginal fistula, under the care of Dr. Oldham and Mr. Bryant, from notes by Mr. Stamper.*—Esther H—, a married woman, æt. 40, was sent up to Guy's Hospital from Wales, by Dr. E. Lloyd, for operative relief. She was a healthy woman, and had given birth to seven children, the last being a year and a half old. The presentation was a cross one, and evisceration of the child was required after labour had existed eighty-four hours. Two weeks subsequently she first observed that her urine came through the vagina, and since that period none had passed the right way. On making a careful examination, an enormous fissure was detected in the upper part of the vagina, readily admitting three fingers into the bladder, the neck of the uterus forming its upper boundary; the parts were, however, soft and healthy. The extreme size of the fistula, and the fact that the uterus formed part of its walls, were points which appeared to militate much against a successful result to any operative measures; nevertheless, upon the strong recommendation of Drs. Oldham and Hicks, I was induced to undertake the operation, with the hope that some benefit, at least, might be conferred upon the patient.

On May 8th, 1861, with the woman turned two thirds over upon her abdomen, and under the influence of chloroform, the operation was performed. A free section of the edges of the fistula was made, this part of the operation having been considerably simplified by the use of the instrument already described. Three metal sutures were inserted some lines from the margin of the wound, one of them being passed through

the neck of the uterus, and Bozeman's splint applied, a catheter was then passed, and left in the bladder, and a grain of opium ordered twice a day. Everything appeared to be going on well till the fifth day, when the patient, fancying that her bowels should be relieved, strained violently; this straining being accompanied with a gush of urine from the vagina, and expulsion of the catheter from the bladder; the latter, however, was reintroduced, and the next day the whole of the urine appeared to pass through that channel. Under these circumstances, it was not thought necessary to make any vaginal examination, fearing that such might again disturb the parts. The next night the catheter again became stopped up, and in the morning at least ten ounces of urine were drawn off. This fact was satisfactory, as it clearly indicated a complete closure of the wound. The bladder also resisted the presence of the catheter; this was accordingly removed, and the urine was ordered to be drawn off at short intervals. From this date everything went on well. On the seventh day, an elastic catheter was passed, and ten ounces of urine were withdrawn. On the twelfth day after the operation, and seventh after the expulsion of the urine through the vagina, a careful examination was made; when the splints and sutures appeared to be firmly in position, and the tissues were free from all signs of inflammation. No indications of the passage of urine through the fistula could be detected; it was, however, deemed desirable to leave things as they were for a few days longer, as only seven days had expired since the urine had passed through the fistula.

On the fourteenth day after the operation the splint was removed, and we had the satisfaction of proving that a perfect cure had been obtained. The edges were beautifully in apposition, and looked quite healthy, cicatrization being nearly complete. The bladder could retain half a pint of urine without inconvenience, and the vagina was as dry as natural. The patient remained in the hospital another fortnight, and returned home cured. She has since been heard of, and the cure was still perfect.

CASE 2. *Vesico-vaginal fistula, under the care of Dr. Braxton Hicks and Mr. Bryant.*—Mary H—, æt. 23, was

admitted into Guy's Hospital on April 3rd, 1861. She was a married woman, and had given birth to five children, four of which were stillborn. The last confinement had taken place one year previously, and the presentation was a footling. Since that date her urine had passed freely from a fistulous opening in the bladder through the vagina. She had been operated on twice previously, six and three months respectively prior to her admission, by a surgeon of great skill; both operations having been spoilt by profuse secondary hæmorrhage into the bladder, and rupture of the parts. When admitted, a careful examination was made, and a fistulous opening into the bladder, large enough to admit the finger, was observed high up; the edges were healthy, but the vagina at this spot was somewhat contracted.

On May 1st, with the patient turned two thirds over on to her abdomen, and under the influence of chloroform, I freely pared the edges of the fistula, using the same instrument as a director; as in the last case, three metallie sutures were introduced, and the perforated shot splints applied; a catheter was passed and fixed in the bladder, and a grain of opium ordered to be given every six hours. Everything progressed favorably; and on the eleventh day the splints and sutures were removed, perfect cicatrization having taken place. The bladder remained somewhat irritable after this date, and continued so when the patient left the hospital on May 30th; although in this respect, under the influence of tonics, she was gradually improving. She left to go abroad with her husband, who was a soldier.

It will be observed that since the publication of the two cases just quoted, many points of practice which were then employed have been given up. The simple wire suture secured by a shot has taken the place of Bozeman's splint, and the periodical introduction of the catheter for its constant wearing. The free use of opium by the mouth has likewise been discontinued, the occasional suppository having taken its place.

CASE 3.—*Vesico-vaginal fistula; operation; recovery.*—Mary C—, æt. 37, was admitted into Guy's Hospital, under my care, on September 19th, 1864, with a vesico-vaginal fis-

tula nearly one inch in diameter. She had been sent up to me for treatment by Mr. Holman, of Uckfield, Sussex. She was a married woman, and had given birth to eleven children. In her last confinement she was delivered by means of instruments, and on that occasion the fistula was produced. It had existed for five months. The fistula was situated at the upper part of the vagina, close to the neck of the uterus; its edges were healthy, and free from cicatricial bands. The whole of the urine passed through the fistula, and the external genital organs were excoriated and inflamed from the irritation which it had produced. The woman's health was far from good. Tonics were consequently given, and perfect cleanliness observed for several weeks, under which the woman's general health much improved, and the genital organs became more healthy. On October 21st the operation was performed.

The woman was placed on a table, and turned two thirds over on her abdomen, with her pelvis well raised by pillows, the right leg being elevated and supported, the left falling over the end of the table, and likewise held. Chloroform was administered, the duck-bill speculum was next introduced, the posterior wall of the vagina held well back by means of an assistant, and the whole vagina thoroughly sponged out, a good view of the fistula being thus obtained. By means of a long scalpel the amount of mucous membrane was mapped out which it was considered requisite to remove, and the largest-sized pronged guide (No. 3) introduced; its points were inserted at the margin of the upper lip of the fistula, close to the mucous lining of the bladder, and passed carefully beneath the mucous membrane of the vagina to the line of incision as previously mapped out; the intervening tissues were then well drawn down by means of the blunt hook to the base of the pronged guide, and the whole cleanly cut off by passing the scalpel along the under surface of the transverse bar. The lower lip of the fistula was subsequently treated in the same way, when its whole margin was found to have been cleanly pared; four silver wire sutures were subsequently introduced by means of the hollow needle, and their ends permanently held and protected by the perforated shot. The bladder and vagina were washed out with cold water, and a suppository of ten grains of compound soap pill introduced into the

rectum, the woman being placed in bed, with her knees bent and legs tied together; everything went on very favorably from day to day, although the patient, who was somewhat weakened, expressed herself as suffering much. The urine was drawn off at regular intervals, and the vagina, which was free from urine, daily washed out. On the eighth day the parts, on being carefully examined, were found to be quite healthy, and to have united. The sutures were consequently removed, and in another week she was declared to be convalescent. She remained in the hospital for a short time longer, and left for her country home quite sound.

CASE 4.—*Recto-vaginal fistula; operation; recovery.*—Mary P—, æt. 40, a married woman, was admitted into Guy's Hospital on May 31st, 1863, under my care and that of Dr. Oldham, with a recto-vaginal fistula of one year's standing. The opening was situated about one inch and a half up the vagina, and was nearly one inch in length; its margins were healthy, and of good consistence. The line of furrow was nearly vertical. On June 14th, the bowels having been freely opened the day previously, the operation was performed. The woman being placed on her back, with her legs drawn up and held as in the lithotomy position, chloroform was given. With the duck-bill speculum the anterior wall of the vagina was held fairly out of the way, and a good view of the fistula secured. By means of sponge and water the parts were then thoroughly cleansed, and the operation commenced. The amount of surface which was to be pared was first sketched out by a sharp-pointed bistoury, and the No. 3 B pronged guide introduced to the right margin of the fistulous opening; the half circle of integument, which it was considered right to remove, was then well pressed down to the prong's base by means of the finger and the blunt hook, and cleanly cut off by one sweep of the knife passed along the bar of the instrument; the other margin of the fistula was treated in the same way with equal facility, and the first step of the operation was satisfactorily completed. The application of a cold sponge soon stopped all bleeding, and the sutures were next introduced. These being readily applied by means of the curved mounted needle, four silver wire sutures were put in, and their

ends fastened by large perforated shot, the margins of the wound being well pressed together, these shot at the same time protecting the opposing surface of the vagina from the irritation caused by the exposed ends of metal wire. A suppository of compound soap pill was given, and the parts thoroughly cleansed with cold water, the woman being replaced in bed. It is unnecessary to give a daily account of her progress, for it was most satisfactory; the parts were all kept very clean, and the urine was drawn off at regular periods. Good diet was given, and a free use of stimulants allowed.

On the eighth day the sutures were removed, and the whole fistula was found to have been firmly united. The bowels soon acted naturally, without pain or any evil effect, and in another fortnight the patient left the hospital, in all respects a sound and healthy woman.

CASE 5.—*Recto-vaginal fistula; operation; recovery.*—I was consulted by my friend Dr. George Frederiek Farr, of West Square, in the case of a lady æt. 26, who was the subject of a recto-vaginal fistula, following a tedious natural labour, four and a half months previously. The fistula was situated about an inch or so up the vagina, and was about the size of a sixpence. The parts around were quite healthy. The bowels having been well cleaned out the day previously, and a simple enema given in the morning of January 16th, 1863, the operation was performed. The patient being placed fully under the influence of chloroform, the pronged guide No. 2 was employed, and the margins of the fistula readily pared in the same way as we have already described. Three silver wire sutures were introduced, and the wound well closed, the edges being firmly pressed together with the finger before covering up the parts; this provision being of value in squeezing out any small clots of blood which may be present to interfere with rapid union, and bringing the surfaces of the wound closely into apposition. The suppository, as usual, was introduced, and the patient placed in bed.

Everything went on from day to day as satisfactorily as could be wished. On the eighth day the sutures were withdrawn, good union having taken place. The bowels acted

naturally soon afterwards, and without any bad result to the parts, and convalescence speedily took place. The patient's ordinary diet was allowed from the first.

CHAPTER LXXII.

ON THE OPERATION FOR THE RELIEF OF A LACERATED PERINÆUM AND SPHINCTER ANI, &c., WITH SOME OF ITS COMPLICATIONS.

THE principles of practice which have been laid down for plastic operations in the vagina, for the relief of the vesico- or recto-vaginal fistulæ, are in a measure applicable to cases of lacerated perinæum, whether simple or complicated, for the objects of the surgeon in both classes of cases are very similar, and they are to be secured by the same ends, the means for obtaining them requiring only such modifications as the change in the situation of the parts affected necessarily demands.

The points which claim attention in this operation are not numerous, although they are most important; success being secured only by their close observance.

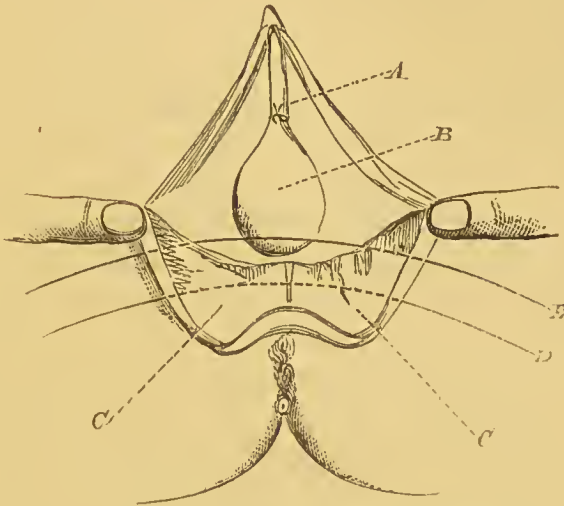
They may be described as follows:

The surgeon having carefully examined the parts, and determined the important question of how much of the lacerated perinæum requires closure, should place his patient on her back in the lithotomy position, and map out the portion of the membrane which he intends to remove, with a sharp scalpel.

He must remember, as a point of primary importance, that the surface of the wound should be *clean and regular*, for it is essential to secure primary union of the two surfaces; the new perinæum also, to be of permanent service, must be *firm, strong, and thick*; for if otherwise, the success of the case will be but partial or of little permanence.

To secure these two objects, a free and clean section of the lacerated perinæum is absolutely essential; it cannot be made

too smooth, nor can the surfaces to be placed in apposition for union be too broad posteriorly towards the rectum ; at least an



A Urethra.

B Orifice of vagina.

C Surface of perinæum, bared of its mucous covering, with the anterior border of recto-vaginal septum.

D Line of introduction of first deep suture.

E Of second deep suture.

inch of raw surface is not too much, when it can be secured, the width of the bared surface diminishing slightly towards the anterior portion of the labia. The best plan to obtain these results is to perforate the parts towards the centre, and as it were slit them up with one sweep of a sharp scalpel ; the right half of the perinæum being first treated, and the left subsequently, the whole area having been mapped out previously by a bistoury.

This *first* step of the operation having been performed, the second, which is of no less importance, remains to be carried out, and that is the bringing of the parts into apposition and keeping them there by sutures. Wire sutures are probably the best for these purposes, for if they do not cause less irritation than smooth silk they are at any rate more manageable. Each one should be inserted at least half an inch, or, better still, an inch from the margin of the wound, and brought out at its posterior border close to the vaginal mucous membrane ; it should be then reintroduced at a cor-

responding point on the opposite side, and brought out at a spot similarly situated to the one at which it was introduced. When the recto-vaginal septum or sphincter ani has been lacerated, the introduction of the posterior suture is of critical importance, for it is an essential element of success that this septum should be likewise included and drawn forwards to the raw surface of the perinæum by the suture. To secure this end the suture must be introduced, as already described, at a point situated on a horizontal line passing through this septum; the needle is to be dipped well into the thickness of the tissues, and instead of making its appearance at the posterior margin of the wound, close to the vaginal mucous membrane, is to be made to pass through the thickness of the recto-vaginal septum, and then out of the right buttock, at a point corresponding to the one at which it was inserted in the left side. When this is well done the wire or silk is buried completely in the tissues, and on being tightened the whole parts are drawn together, as it were towards a centre, corresponding to the anterior portion of the anus and posterior of the perinæum. The other anterior sutures may be applied as already directed.

With respect to the necessity of dividing the sphincter ani in this operation, I will only add that I have not yet met with a case requiring such treatment.

The sutures need not be removed at too early a period, the eighth or tenth day being generally the best, but when good union has taken place, the practice of leaving them in position is certainly unnecessary, if not injurious. The *urine* should be drawn off at regular intervals, and the *bowels* kept quiet by means of opium. The ten-grain suppository of the compound soap pill, after the operation, is a valuable practice in this as in all cases of abdominal surgery, for it allays local spasms, keeps the bowels in a quiescent condition, and secures rest to the stomach, which, after chloroform, is so apt to be irritable. Perfect *cleanliness* is essential during the whole treatment of these cases; and the horizontal posture is to be maintained, the legs being tied together. The patient's diet should be liberal and much as usual.

Success in these cases depends much upon what are termed small matters, and it is of great importance to give them due

care and attention, for recovery may, as a rule, be secured in all these cases, however complicated.

I shall now proceed to quote a few cases illustrative of the practice I have laid down. They are successful examples, and may be taken as types of all others.

CASE 6.—*Laceration of the perinæum, completely through the sphincter ani, and at least one inch of the recto-vaginal septum; operation; recovery.*—Alice H—, æt. 35, was admitted into Guy's, under Dr. Oldham's and my care, on June 3, 1863. She had been the subject of this distressing condition for eight years, the laceration having followed her first natural labour; she had had five children since, and it was believed that during the last confinement some increase of the original mischief had been sustained. Her general health was very good, and the genital organs were quite healthy.

On making a careful examination of the parts, I discovered the most severe laceration which it has fallen to my lot to witness; the vagina and rectum were literally converted into one large orifice; the sphincter had been completely torn through with the perinæum, and at least one inch of the recto-vaginal septum had been likewise divided, the mucous membrane of the rectum bulging forward into the vagina. The fæces and flatus passed without any hindrance, for no indication of control over the anal orifice existed.

I undertook the treatment of this case with considerable apprehension, for I expected that if the perinæum and anal orifice could be restored, a recto-vaginal fistula would be left, although a second operation might succeed in its ultimate occlusion.

On June 12th, 1863, I proceeded to operate, the lower bowels having been the day before completely cleared out by purgatives and enemata.

The patient having been brought under the influence of chloroform, was placed upon her back, as in the position for lithotomy, and with the scalpel the margin of the labia and perinæum, backwards to the anus, were stripped of their mucous coverings, for at least three quarters of an inch in width; the margins of the lacerated recto-vaginal septum were then pared with the transverse border of the septum. The

whole surface of the parts to be brought together were thus completely stripped of their mucous covering, and had now to be adjusted by means of sutures. Silver wire sutures were employed.

The first, the most important, was inserted at the lower part of the wound as the patient rested, and into the left buttock, at least one inch and a half from the margin of the fissure, and in a line parallel with the recto-vaginal septum, the needle was passed well into the tissue, and insinuated unseen horizontally through the transverse border of the recto-vaginal septum and up through the tissues of the right side, coming out on the right side at a spot corresponding to the point of entrance on the left; during its passage it was completely buried in the tissues; the needle and wire were then drawn through, and when the latter was tightened, the sides of the perinæum and divided border of the sphincter and anus, with the recto-vaginal septum, were well drawn up together firmly in apposition; two other sutures were introduced to bring the anterior border of the perinæum together, a suppository introduced, and the patient placed in bed. An uninterrupted progress towards recovery marked the subsequent history of this case; the wound healed most kindly; the posterior or most important suture was removed on the eighth day, and the other two on the tenth; in another day the bowels acted, and the motions passed along their natural channel; the sphincter soon showed evidence of its power by controlling the action of the bowels and retaining flatus, and in six weeks from the day of operation the patient left the hospital quite well.

CASE 7.—*Ruptured perinæum and sphincter ani; no control over action of the bowels; operation; recovery.*—Eliza B—, æt. 28, a married woman, the mother of four children, was admitted into Guy's, under Dr. Oldham's and my care, on May, 1863. She had been the subject of her present condition for four years, the laceration having taken place during her first confinement, which was a very tedious one.

The whole perinæum had been completely torn through, with the sphincter ani. Fæces and flatus passed without the slightest control, rendering the woman's life wretched. Her

general health was good, and altogether the case presented a very favorable prospect for operation.

On June 20th the woman was brought under the influence of chloroform, and placed upon her back in the lithotomy position; the lacerated borders of the perinæum backwards to the anus, together with its anterior lacerated margin, were then completely bared of their mucous covering, a good broad surface—varying from half to three quarters of an inch—being removed. Three silver sutures were next introduced, the posterior one being passed through the recto-vaginal septum, and all introduced at least one inch from the margin of the wound. An opiate suppository was also given.

On the ninth day the sutures were removed, good union having taken place; on the fifteenth, the bowels acted naturally, and complete control over the sphincter was rapidly regained, the woman leaving the hospital in all respects sound and well.

CASE 8.—Laceration of the perinæum down to sphincter, with prolapse of the anterior wall of the vagina; operation; recovery.—Fanny C—, æt. 33, a healthy married woman, was admitted into Mary's Ward, Guy's Hospital, under Dr. Oldham's and my care, on September 16th, 1863. She had had one child twelve years previously, and it was on that occasion her present injury was received. She had been operated upon four years afterwards by a physician-aecoucheur, but without success, the union having been but partial and very thin.

On October 7th, chloroform having been given, the patient was placed on a table, on her back, with her legs flexed and raised; the sides of the perinæum were then very freely stripped of their mucous covering backwards to the sphincter, at least one inch of surface in width having been removed, and four silver sutures introduced. The vagina having been closed as completely as possible consistent with the maintenance of its natural uses, an opiate suppository was given as usual.

On the ninth day the sutures were removed, and good union had taken place. The woman remained in the hospital some little time after, and a good solid perinæum was found to have been formed. The prolapse of the vagina was cured with all other inconveniences, the patient leaving quite well.

CASE 9. — *Lacerated perinæum completely through the sphincter ani, with prolapse of the posterior wall of the vagina; operation; recovery.*—I was asked by Mr. Pocock, of Brixton, in August, 1863, to see a lady, æt. 30, who for two years had been rendered miserable by her inability to control the actions of the bowels, except when very constipated. The injury had been received during her first and only confinement; the labour having been a natural one, although very tedious.

On examining the parts, I found that a most complete laceration of the perinæum had been sustained, and that this laceration had extended through the external sphincter of the anus, the posterior wall of the vagina bulged considerably forwards, and when the patient stood it fell still more, even externally.

On August 24th, the patient's bowels having been previously thoroughly cleansed by an aperient and enema, chloroform was given, and the operation performed. The posterior borders of the perinæum were freely pared, together with the anterior margin of the anus, a piece of the mucous membrane of the posterior wall of the vagina, beginning at the sphincter, being also removed. Three silver sutures were next introduced, the posterior one the first, the wire being made, as in the other cases related, to pass through the anterior border of the recto-vaginal septum. The ends of the wires after being twisted were secured and protected by perforated shot.

On the eighth day the sutures were removed, the wound having healed kindly. The bowels subsequently acted spontaneously, and a good convalescence followed, perfect control over the action of the bowels having been secured, and the tendency to the vaginal prolapse prevented.

CLINICAL SURGERY.

ON

O V A R I O T O M Y,

BY

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PREFACE.

When these papers on Clinical Surgery were commenced, six years since, it never entered into my scheme to devote a part to the consideration of Ovariectomy.

I have been induced to do so on the present occasion, as the subject is one upon which I have some little experience to give, and as it naturally follows the concluding chapters of the part published last year on some of the operations upon the female sexual organs.

I have to thank my friend Dr. J. J. PHILLIPS for his valuable aid in the compilation and analysis of the cases which will be found in the appendix; and Dr. MACKENZIE BACON for his able assistance in passing these pages through the press.

I may add that as the subject is a separate one, I have had this part bound up and arranged as a distinct volume, and as Part VII. of my Clinical Surgery.

THOMAS BRYANT.

2, Finsbury Square.

January 1, 1867.

ON OVARIOTOMY.

CHAPTER LXXIII.

IS OVARIOTOMY TO BE REGARDED AS A JUSTIFIABLE OPERATION?

There is little doubt as to the answer which the majority of surgeons must give to the question stated at the heading of the present chapter; for the operation of Ovariectomy is now performed by nearly all of those who have an opportunity of practising it, and the fear is, not so much that cases will be overlooked, as that they may be undertaken in haste and without due consideration.

It may be asserted, therefore, with considerable confidence that Ovariectomy is a justifiable operation, and that it is now fairly recognized as such by most surgeons, standing foremost amongst the chief triumphs of modern surgery. And yet it must be admitted that there is no operation which has made its way against greater opposition and more determined hostility—none that has been regarded with greater horror by its opponents, or that has been looked upon with greater favour by those who have had the boldness to stand forward as its advocates. In looking back to the opinions of many of the so called magnates of our profession who, in the early struggles of this operation for due recognition, were pleased to express a definite opinion as to its merits, we may well

blush to read that it was described by the great Liston as "belly ripping," and by Velpeau as "an operation on no account to be admitted into French Surgery;" that Dr. Meigs, of America, looked on the operation for the extirpation of a diseased ovary as "not to be justified by any amount of success"; and Scanzoni "as a proof of madness in the patient who should adopt, and of crime in the Surgeon who should abet such a mode of suicide;" that M. Malgaigne regarded it as "infinitely too radical, and well calculated to secure women *too* absolutely against the danger of relapse;" and that Cruveilhier did not think "this bold operation entitled to be cited in science; for rash enterprises are not always justified by their success." Yet the operator admitted that there was no palliative or curative treatment for the majority of these cases, and that they were "marked with the seal of incurability."—(*Transactions of Imperial Academy of Medicine, at Paris, 1856.*)

We cannot forget that in 1850 the wise and learned Lawrence publicly asked at our chief Medical Society "whether the attempt at treating diseased ovaries by surgical operation can be encouraged and continued without danger to the character of the profession?" and that even now the enemies of the operation can number amongst their body no less a man than Dr. Robert Lee. Still the voice of authority, however high, has but a limited power. The influence of reason and experience is always greater, for in spite of all this hostility and active opposition, the operation has made steady progress in the estimation of the profession, and the persistent denunciation of the few, at the present day, only renders more marked and prominent the support which it so largely receives from the many.

On the other hand, we must remember that Sir B. Brodie always gave it his sanction, although no case is recorded in which he practised that operation, and, as a Guy's man, it would ill become me to forget that, amongst the very earliest operators, we find the names of Mr. Morgan, Mr. Aston Key, and Mr. Bransby Cooper.

It must be related, also, with some amount of pride, that the aged Blundell is to be numbered amongst its earliest advocates, for, upwards of twenty years ago, he wrote to Dr.

Clay, of Manchester, in the most encouraging terms, and recommended him to persevere with his ovarian operations, "applauded by all who have the honesty, and intelligence enough to appreciate your efforts." "A few years, and I trust," he went on, "it will appear abdominal surgery is at present only in its infancy,—but then what an infancy! How full of bloom and promise!"

Again, alluding to the current criticisms upon the operation, he says—"These men are butting their heads against a stone wall, and the grimaces they make, on feeling the solidity of the materials, are as amusing as they are pitiable."

But let us put aside all these reminiscences—for such they may with truth be called—for Lawrence and Dr. Robert Lee live still amongst us to witness the triumphant recognition of a great operation by the majority of surgeons, and Blundell has been spared to witness the no small realization of the hopes he so eloquently expressed.

If we turn to the arguments which have been employed by the opponents of ovariectomy, we shall find that they are for the most part as unsatisfactory as they can well be,—for the most energetic and determined objectors seem to have based their objections on theoretical grounds alone, and to have had little or no regard to the facts which experience may have communicated. They appear to have thought that the operation was to be put down by ridicule and abuse, and that it deserved no scientific discussion or honest trial. The opinions of Lawrence, Dr. Meigs, Velpeau, and Scanzoni—which have already been quoted—are sufficient to prove the correctness of these observations, for they contain no argument, but only bold and unscientific condemnation. Yet there have been some few opponents with whom arguments have had their weight, who saw objections which were in a measure sound, and which had to be met, who recognised the weakness inherent in a limited experience, and condemned an operation in its infancy, because it had not the strength of an established and confirmed position. It will be well, therefore, for us to consider for a few minutes what those objections were and to weigh their import, for if they were real they must still have some weight, and by boldly facing them they are the most likely to be overcome. Amongst these

objections, the uncertainty of forming an absolutely correct diagnosis stands unquestionably in the foremost place; and no one will be disposed to deny the weight of the objection nor its fundamental importance, should it be generally established. But first of all is it true? Can it be proved by any one that there is *in general* great uncertainty as to the diagnosis of an ovarian cyst? Can it be even shown that there is more uncertainty in the diagnosis of an ovarian tumour than there is in many other known forms of disease? Can it even be proved that there is as much in this as in some?

That errors in diagnosis have been made, and that surgeons have been led to operate with an uncertain diagnosis, are truths which are quite indisputable; but the same observations might be made against every operation, even against those which are regarded as the best established. Have not patients been cut before now for stone when no stone existed, even by experienced men—and have not arteries been ligatured for imaginary aneurisms? But it must be shown that such errors in diagnosis were unavoidable; it must be made plain that with all the scientific means at the disposal of the practitioner, the true condition of affairs could not have been made out with anything like certainty, and it must be left to those who, on these grounds, would condemn the operation, to justify the operator in undertaking so serious a measure as Ovariectomy, when surrounded with doubt as to the nature of the disease, and without having employed every recognised and legitimate means of forming or confirming a correct diagnosis; for I am unaware that the most passionate supporter of the operation has ever recommended indiscriminate Ovariectomy, or that every example of supposed ovarian disease should be extirpated. It is manifestly unfair to saddle any operation, no matter what its nature, with faults which should be assigned to the operating surgeon, to his want of care, or want of judgment.

For, as the difficulties of an operation form no argument against its use, although they may be strong arguments against a surgeon undertaking it without thought or without knowledge, so the difficulties of diagnosis in any simple case can form no general argument against any operation, whether ovarian or otherwise, although they may seriously tell

against the attempt in particular instances, and against the Surgeon who is rash enough to undertake the task. For no operation, large or small, should be undertaken when the nature of the disease is not clearly understood; nor when the reasons for operative interference are indefinite and uncertain; and no diagnosis should be considered as complete until every known means of examination have been employed and exhausted, and a scientific probability, if not certainty as to the nature of the disease has been legitimately established.

And yet it must be confessed that there are cases of abdominal disease which simulate ovarian, and the differential diagnosis of which it may appear impossible to make out; and it must be looked upon as a truth that an absolutely accurate diagnosis of the disease is not to established in all instances—but under these circumstances are these the cases the surgeon ought to touch? Is he justified in exposing a patient to the risk of so severe an operation as Ovariectomy as long as any doubt hangs on the nature of the case, or the probability of obtaining a successful issue to any operative measure is uncertain, to say the least of it; and would it not be the most scientific and expedient practice for the surgeon to put aside such cases for the time, and wait to see what light may be thrown upon the case by observation and by the progress of the disease?

For although absolute certainty is scarcely to be looked for in the diagnosis of any disease,—a certainty that is completely free from fallacy, and all doubt,—still, when a sound scientific probability supports the surgeon in his diagnosis, and on this basis a good hope of relief is to be entertained by operative measures, he is as justified in performing an operation such as Ovariectomy as he is in adopting any ordinary surgical proceeding, under any other circumstances; and, should he err, this error will be but light; but it may with confidence be asserted that such errors of diagnosis should be very rare.

On looking back to the published cases in which errors of diagnosis have been made, and more particularly to the cases published by Clay in his edition of *Kiwisch*, we find there have been 23 operations abandoned on account of the tumour not having been ovarian: of these 12 were uterine;

1 splenic; 2 omental; 1 supposed tubal factation; 2 chronic peritonitis; 1 mesenteric; in 2 no tumour could be discovered; 1 was mere obesity; 1 nature not stated. Sixteen of these 23 cases, however, fortunately recovered; 3 died, and in 4 the result was not stated.

More recent additions might be made, but the above amply suffice for illustration.

Amongst all these cases, can it be said that there were none in which a correct diagnosis could have been made by the use of every known means by which the abdomen can be examined, and by which the true or probable condition of the uterus can be made out?

Can it be said that great and scrupulous care was taken in all these instances to render the diagnosis complete, and that the general opinion of those who had examined the cases was so certain as to the ovarian nature of the disease as to justify the operation, and exculpate the surgeon in whose hands they rested, from the charge of precipitancy, if not rashness?

Was the pelvic condition of the patient made out in all these cases? and what was, or would have been, the result of a careful exploration of the uterus by the uterine sound?

A surgeon invariably refuses to cut a patient for stone in the bladder, unless its actual presence has been clearly established on the passage of a sound, just prior to the operation, and when the calculus is not felt, the operation is inevitably put off till certainty is established.

Should less care be taken of a woman labouring under supposed ovarian disease?—should gastrotomy ever be performed upon a supposition?—should not an approach to a reasonable certainty exist before the operation is commenced?—should not every means for rendering the diagnosis complete have been exhausted before the operation is thought of?—should not the pelvic depth be ascertained, and the uterus sounded in these cases as in others, before an operation is determined upon?—should not a patient suffering from a doubtful ovarian disease be sent away till a greater certainty is obtained in the same way as a patient labouring under the dubious presence of a calculus is invariably treated?

I have no hesitation in asserting that the practice I have just indicated is the sound one, and the most scientific: it is sound

because, by its adoption, we shall eliminate most of those cases in which an error of diagnosis may be fallen into, and upon which an error in practice would probably be based; it is scientific because it is founded on the principles which surgeons have decided to act on in other cases, drawn from the theory of their wisdom, and the experience of their value.

But is the diagnosis of an ovarian tumour really difficult? Can it be stated that as a rule uncertainty exists as to the presence of an ovarian tumour?—and are the means of diagnosis so limited that in the majority of cases no nearer approach to truth can be made out than a fair probability?

I take it, there are few men of the present day who will answer the questions thus briefly propounded in the affirmative, and that those who have had experience in the matter will be content to assert that a difficulty of diagnosis may exist in exceptional circumstances, but that in general a definite opinion may be given. It is to be added, however, that this diagnosis is only to be made reasonably certain by great care. The examination of the abdomen from without, however carefully performed, and however skilful may be the practitioner who makes it, may lead astray if relied on too much, and trusted in with too much confidence. For, although ovarian tumours have their special abdominal characteristics, and may generally be recognized, still in exceptional cases uterine tumours, vesical, pelvic, and hydatid tumours, with others, may occasionally, in their external and superficial characters, simulate the ovarian, and thus mislead. The experience of the past tells us that this is the case—for even pregnancy—uterine tumours of all kinds, and a distended bladder, have been overlooked, and hastily regarded as ovarian by those who have placed too much confidence in a simple external abdominal examination.

Had other measures been employed it seems probable that these errors would have been avoided; and, had all the means, which in process of time have been brought to bear upon these cases, been used, a correct diagnosis might have been made. Amongst these other means, a careful examination of the pelvis is unquestionably to be named as the most important, an examination by the finger, by the uterine sound, and by the catheter.

By these we may learn the position, mobility, size, and connexions of the uterus, the condition of the bladder, and the state of the pelvis. We may find out whether the abdominal tumour has a pelvic origin or otherwise; indeed, we may acquire information by this plan of examination, which is to be acquired by no other means, and we thus gain a valuable and necessary insight into the condition of the patient under examination, which would otherwise be lost and unattainable.

In the virgin subject it is true there may exist objections, if not obstacles, to the carrying out of the examination we have just recommended; indeed, a vaginal examination in certain of these cases cannot be undertaken; still much may be learnt of the size, position, &c., of the uterus by an examination from the bowel, and under these conditions such a pelvic exploration should be carefully made. To show that these remarks are not merely theoretical, I must add that in my own practice, on two separate occasions, a careful pelvic examination has prevented an operation for Ovariectomy being undertaken where every other symptom and condition tended to show that ovarian disease existed, uncomplicated with other conditions—and in these two cases therefore a desperate operation, based on a mistaken diagnosis, was thus prevented.

It is fair, therefore, to believe that in at least a certain proportion of the cases which have been unnecessarily operated upon, a correct diagnosis could have been made had proper caution been adopted and the true condition of the uterus made out—for surely retained menses, from an imperforate hymen, pregnancy, and uterine tumours would have been recognized, had any suspicion of their existence been entertained, or had a vaginal and uterine examination been instituted. At any rate, a nearer approach to truth would have been arrived at, and more knowledge would have existed to guide the surgeon in his decision as to the desirability or not of the operation.

Another argument, which has been adduced against Ovariectomy by its opponents, refers to the danger of the operation, and they have affirmed that its actual fatality is so great as to warrant its rejection. They have not only disputed the accuracy of the statistics which have been brought forward, but, assuming them to be true, they have asserted that they are

enough to condemn the operation. They have been willing to admit that certain cases recover, but that the majority die, and that an operation which can show such limited success ought not to be supported. In these days, however, I take it there are few men who would be disposed to support the arguments which have been just enunciated. Both the accuracy and the number of the statistics we possess are amply sufficient to negative the truth of the statements they contain—and to rob the arguments based upon them of their due weight.

For the reliable statistics of Ovariectomy, as we shall presently show, are amply sufficient to prove that the mortality of the operation is not so great as to prohibit its performance, and will bear favourable comparison with those of many of the large and well-recognised operations in surgery. Indeed, on this ground, they are enough for the advocates of Ovariectomy to base an argument upon in its favour, of no mean weight, for the comparison tells us that this is no more fatal than many of the well-established surgical operations, and is less so than some. If we compare it with the results of some forms of amputation, of those of expediency—for it is with those only that just comparison can be drawn—we shall find, as Mr. Erichsen has well stated, that the advantageous position of Ovariectomy is well seen; for taking only the cases which I had the pleasure of tabulating from Guy's Hospital, and publishing in the *Medico-Chirurgical Society's Transactions* in 1859, it will be found that amputations (of expediency) of the leg are fatal in the proportion of 66 per cent., and if we look to the chapter on the statistics of Ovariectomy we shall find that, taking them as a whole, the mortality of the operation was but 36 per cent.

If we take the more recent experience only, we find that the mortality has been considerably lessened, and with this knowledge the comparison tells with still greater force in favour of Ovariectomy. As an operation of the first magnitude, it is now marvellously successful, and, as experience is accumulated and utilized, will doubtless succeed still better.

But there is yet another argument in favour of Ovariectomy, which cannot be overlooked. It is one of some force, and is based upon the comparison between it and most other operations;

and it is this, that Ovariectomy, when successful, is complete in all respects. The patient is relieved of a burden, which to a certainty would prove fatal, and is so left that in no single condition or function is there any impairment; from a state of mere existence, or from a living death, she is restored to perfect health and usefulness, and, as a social being, she is well able to discharge every duty demanded of her sex.

In most surgical operations this enviable result is not to be obtained—the patient may be relieved of the disease, but there is a source of weakness left, some function has been destroyed, some power has been weakened—the integrity of the whole body has been interfered with, and although life has been spared, it is at the expense of usefulness, or at the loss of some bodily function. This point is one which tells strongly in favour of the operation.

Again, Ovariectomy presents itself to the surgeon in another light. It is a means of relieving a patient of a disease which is practically incurable by any other means. In many examples of ovarian disease, indeed, in the majority, it is the only means by which life can, probably, be prolonged and a miserable death averted. Under such circumstances, it is not a question of choice, whether Ovariectomy is the best form of treatment, in comparison with others, for there is no choice—it is whether the only means shall be attempted or the patient be left to the natural progressive downward path, which patients suffering from ovarian disease are bound to tread. The point for decision is, consequently, a definite one, and must be fairly met.

As a conclusion it may, therefore, be confidently asserted that Ovariectomy is a justifiable operation and that under certain conditions it ought to be performed; that it presents itself to the patient as the only means by which a perfect cure can be looked for from a disease which will necessarily destroy at no distant date, and that when successful it is the most so of all capital operations, for it leaves the patient perfect in every respect, and completely competent to discharge the duties demanded of her sex.

CHAPTER LXXIV.

HISTORY OF THE OPERATION.

WE have already stated that there are but few now who would venture to refuse to Ovariectomy an established place among the legitimate operations of surgery, yet it is not many years ago since its advocates or apologists were greatly in the minority, and the lapse of ten years has sufficed to show several of its foremost opponents transferred to the ranks of the party of "reform." There is, therefore, more than usual interest in reviewing the phases of opinion on this subject, and it is somewhat curious to note the anxiety that has been displayed in determining to whom the honour of the first operation belongs now that success has justified what argument was so little able by itself to enforce, and the logic of facts has determined what theory failed to accomplish. This question of priority is, certainly, one of very small moment, and, perhaps, becomes of still less when we look back into ancient history and find that an operation which we so long hesitated to undertake, was performed experimentally ages ago, and has been for centuries a matter of reasonable speculation.

Thus, looking back to early times, we find that the Greek historian, Athenæus, relates how Andramystes, king of Lydia, removed the ovaries of women intended to replace the eunuchs in his palace, and, according to Hesychius and Suidas, Gyges, king of Lydia, who reigned in the 7th century, *B.C.*, did the same in order to prolong the youth of his victims, while Wierus tells of an Hungarian butcher who, irritated at his daughter's follies, extirpated her ovaries in the same way that he operated on animals, and she is said to have survived the mutilation.

Similar things are reported of the Creophages and Egyptians.

Reasoning from analogy there would seem to be no cause why the operation should be impracticable, for it has been performed on animals from the oldest time with impunity. Thus Galen¹ speaks of the castration of turkeys, and Aristotle of the same treatment of female camels and of cows, while it has been practised on bitches, sheep, and birds continually. The idea has thus been long present to the mind, but its application to disease is the growth of later years, and naturally bears a relation to the advance of more accurate means of diagnosis. In some points the history of Ovariectomy resembles that of lithotomy, as its first successes happened to those who undertook it ignorantly, but, unlike this latter operation, it did not continue to be practised by those who, so to speak, had stumbled on an unexpected triumph, for the older writers seem to have either timidly advocated it in theory or else to have been overwhelmed with the notion of the dangers incidental to it.

Fel. Platter,² who published his observations in 1680, sought to justify the operation in certain cases, and we are led to infer that there must have been here and there a case undertaken previously, but the first recorded proposal to extirpate a diseased ovary was by Theodore Schorkopff (in 1685) who wrote thus:—"Majorem afferret medelam ipsius ovarü per sectionem exstirpatio, nisi crudelis et majore cum periculo conjuncta videretur."

Some years later, Peyer³ (in 1718) raised the question whether ovarian cysts might not be removed during the early period of their formation, as did another writer, Schlenker,⁴ in 1722, and Tozzetti⁵ (in 1752), and these were followed by Schaeffer (1724), Willius (1731), Imhoff (1751), and De Haen (1757), who all expressed very strong opinions against the operation, while Theden, about the same date, advancing a step beyond speculation, proposed making an incision above the groin, and trying to remove the cyst after having passed a ligature round the pedicle.

¹ Galen, *De Semine*, &c.

² *Acta Helvetica*.

³ *Observ.*, 1680, p. 248.

⁴ *De sing. ovarii sinistri morbo*.

⁵ *Prima raccolta dei osservazioni mediche*.

Morgagni,⁶ too, in describing cases of ovarian dropsy, alludes to a case published by Cyprianus, at Leyden (1720), in which a foetus had been successfully removed from the right fallopian tube by incision, and refers to the radical cure of the disease in these words:—

“That the cyst, therefore, after discharging its original fluid, should not be again distended with a fresh one, it would be necessary, if possible, to consume or extirpate it entirely; as is done in external follicles. But who could propose, or even bear the first of these operations on a large sac that is hidden among the viscera? The second, indeed, I know has been proposed by some who were encourag’d thereto, by that well known, but very rare, cure of Abr. Cyprianus; yet, whether anyone has made the trial within these thirty years, or more, since it was propos’d, I cannot determine. . . . If the cyst were always supported by one root alone, on which a ligature might easily be made; as in the observation of Mauchartus, or in that of Schrockius, you would, perhaps, begin to give ear to the proposition. But what? If there were more roots than one, or if there was one very broad, and not, as it was with them, ‘very narrow,’ or ‘of the thickness of a man’s thumb:’ What? if the cyst should be connected to one part, and to another, and even at a great distance from that part of the abdomen which, in imitation of Cyprianus, you would cut into.”

Such doubts were natural enough then, though with our present experience we can hardly withhold a smile at the objections which Morgagni considered so conclusive.

In 1781 a fresh impetus was given to the subject by the celebrated case of Laumonier, of Rouen. This case has been often claimed as the first Ovariectomy, but very unjustly, for the operator had no intention of removing an ovary at all, and supposing this objection put aside, the fact remains that Mr. Pott,⁷ in 1770, had done the same thing, by excising two tumours in the inguinal region, which proved to be protrusions of the ovaries. Laumonier’s case was this:—

“A woman, æt. 21, who had recently been confined, suffered for 6 or 7 weeks from slow fever with colliquative

⁶ Epist. 38.

⁷ Surgical Works.

diarrhoea and a profuse and foetid vaginal discharge. She had in the hypogastric region, which was tense and hard, a hard swelling, pressure on which caused a purulent discharge from the vagina. The affection was considered to be due to a collection (*un depot laiteux*) in the ovary and tube, which it was decided to open.

“Laumonier made an incision of about $4\frac{1}{2}$ inches long parallel with the groin, and laid bare a bluish, fluctuating swelling, adherent at its lowest part and surmounted by another tumour, of the size of an egg, formed by the ovary. Pressure on the fluctuating swelling which was formed by the tube, caused the escape of a small quantity of pus from the vagina. This fluctuating swelling was opened from the small tumour formed by the ovary as far as the junction of the tube with the angle of the uterus, and a pint of dark, purulent, and extraordinarily foetid fluid escaped. The ovary, being considered as having become scirrhus, was detached from the tube, which gave rise to an insignificant hæmorrhage. The cavity of the tube was then filled with lint soaked in a mixture of honey and yolk of an egg. The dressing was not removed till the third day, when there escaped from the wound 5 or 6 ounces of sanious and offensive matter. As the intestines were inflamed and adhered in all the circumference of the tumour to the abdominal wall, Laumonier wished to separate them, so as to prevent, he said, the painful dragging that these sorts of adhesions often occasion after the cure of the diseases that have given rise to them, but, fortunately, he found the resistance too great, and the sufferings of the patient too acute to allow his carrying into execution his plan, which would, inevitably, have been followed by fatal peritonitis. About the 16th day, the cavity of the tube was reduced nearly to the size of an egg, and at the end of a month the wound was perfectly healed.”—(*Kæberlé, De l'Ovariectomie*—p. 11.)

This case was regarded chiefly as a curiosity, and did not stimulate anyone to venture on an imitation, though the question began to be discussed more seriously, and John Hunter (in 1786) expressed himself very decidedly, as follows:—“If taken in the incipient stage they (*i.e.*, diseased ovaries) might be taken out, as they generally render life disagreeable for a year or two and kill in the end. There is

no reason why women should not bear spaying as well as other animals."

Subsequently a French writer, M. Chambon⁸ (1798) entered fully into the question and boldly advocated excision, using these remarkable words:—

"We are persuaded that the time will come when this operation will be extended to more numerous cases than those in which we have proposed it, and that there will be no difficulty in putting it into practice."

Another French surgeon, D'Escher,⁹ in 1808, proposed an operation in detail, but in 1809 the first genuine extirpation of an ovarian cyst was undertaken by an American surgeon, Ephraim MacDowell, of Kentucky, and the case was successful, the patient living to the good old age of 78, and dying in the year 1841.

I think there can be no doubt that this gentleman is fairly entitled to the honour of priority, but those who feel any jealousy on the point may solace themselves with the recollection that he was a pupil of John Bell, and imbibed his notions of surgery from the mother country. MacDowell is said to have operated 13 times before his death (1830), and eight times with success. His example was soon followed by others in America, and up to 1865 it is calculated that 300 operations have been performed in that country, of which 179 were successful.

In our own country, Lizars, of Edinburgh, led the way, and his case (in 1825) was the first successful example of Ovariectomy in this island.

Two years afterwards Dr. Granville made two unsuccessful attempts in London, but the first completed case in the metropolis (a fatal one) was by Benjamin Phillips in 1840.

In the meantime, however, a country surgeon, Mr. Jeaffreson, of Framlingham, Suffolk, in the year 1836, had operated successfully, and was the first to gain so honourable a distinction in England.

A few years later we find more attempts in London, and, in 1842, Walne, F. Bird, and Lane, had all operated with success, while, in the same year, Charles Clay, of Manchester, had begun his now long series of cases, numbering, between

⁸ *Maladies des Femmes*, chap. 39.

⁹ *Considerations Medico-Chirurgicales sur l'Hydropsie enkystée des ovaires.*

1842 and 1864, 110, of which 76 recovered. It is only right, however, to mention that the first successful case of ovariectomy in the metropolis occurred in the practice of the late Mr. Walne in 1842, and the first successful case in a metropolitan hospital fell to the hands of Mr. Cæsar Hawkins, at St. George's Hospital, in the year 1846.

As a Guy's man, I must not forget to mention that the first attempt to perform ovariectomy in a London hospital was made by Mr. John Morgan in the year 1839; that in 1843 at Guy's Hospital, my old, respected, and valued teacher, Mr. Aston Key, removed *both* ovaries, the patient dying on the fourth day, and that Mr. Bransby Cooper extirpated an ovarian tumour, but the patient died on the seventh day. In Ireland, Dr. Thompson, I believe, performed the first successful Ovariectomy, in 1848.

The operation being thus fairly launched, surgeons began to practise what their predecessors had been so eager to vilify, but till within a very short time there have not been wanting numerous and very able opponents, and there is no surgical proceeding, probably, which has had to encounter so much vituperation as well as fair and conscientious opposition.

Its course in foreign countries has not been more smooth. In France, though advocated by Delaporte in 1753, and experimentally tried by Laumonier, the tide of opinion set in so strongly against the operation, that, despite the numerous successes in England and America, only eight cases were attempted between 1782 and 1861, of which but three recovered. M. Velpeau, indeed, recorded his opinion that "the extirpation of diseased ovaries is a frightful operation which ought to be proscribed, even if the cures announced are real," and similar opinions were expressed in the Paris Academy so late as 1856. Indeed, we cannot but feel the truth of M. Stoltz's rather bitter remark:—"Ce n'est pas la première fois qu'on repousse en France, avec obstination, un procédé opératoire parceque théoriquement on croit sa réussite impossible, ou parcequ'il n'a pas réussi entre les mains de certaines personnes."

M. Nélaton, whose first case was in 1862,¹⁰ undeterred by

¹⁰ The state of public feeling, at the time, on the subject may be guessed from the sarcasm appended to this case when published:—"La malade de M. Nélaton est morte guérie!"

such opinions, persevered in his efforts, and was followed by Koeberle, of Strasbourg, one of the most successful operators, but he has so far had but few imitators.

In Germany, the first operation was by Chrysmar, in Wurtemberg, in 1819, and he was slowly followed by Quittenbaum, Dieffenbach, Langenbeck and others, but the results were unfavourable, and up to the end of 1863 only 74 cases had been recorded in all Germany.

In Italy, the first recorded case is a successful one, by Sig. Emiliani, of Faenza, in 1815.

In Spain, Dr. Rubio, of Seville, operated for the first time, Oct. 5th, 1863, but the patient unfortunately died.

In Australia, the first success has fallen to the lot of Dr. Tracy, of Melbourne University, in 1864; and in New Zealand, March 12th, 1866, Dr. Mackinnon, an army surgeon, performed ovariectomy for the first time. We hear, too, from India, Russia, and California (seven cases up to 1860) of successful cases, and may now indulge the hope that the benefits of this operation will soon be shared by sufferers in all climates and countries.

It is, however, undoubtedly in England, that the greatest success has been met with, that the operation has been most practised, and that the greatest pains have been taken—not only to improve the various steps but to study the cases and secure more accurate means of diagnosis. By these means the operation has escaped from the category of empirical successes, and attained a place in legitimate and scientific surgery, and to this is to be attributed the superiority in practice we have gained in this country. It has thriven under the obloquy and opposition it encountered in its early days, for its advocates have thus been stimulated to increased attention to the subject, and the result is seen in the rich harvest that surgery has gathered in a new field, not merely in the rescue of hundreds of women from a miserable life and a certain death, but in their restoration to perfect health, undisturbed by fears of a return of their malady. It is not so much by individual efforts as by the wholesome rivalry that has arisen in the profession that these results have been brought about, yet it is only fair to certain men who, like Dr. C. Clay, of Manchester—the first great apostle of Ovari-

otomy in this country—Mr. Lane, Baker Brown, and Spencer Wells, in London, and others, have led the way, and overcome the barriers of prejudice and opposition by the practical argument of their successes, to acknowledge the services they have done in establishing this advance of British surgery. A few figures will show how rapidly it has advanced.

Between 1825 and 1840 *nine* cases were operated on in Great Britain; during the succeeding 15 years *one hundred and eleven* cases were recorded, and in the next five years no less than *one hundred and twenty-four*.

The great majority of these cases occurred in London, as might naturally be expected, but while these facts have been discussed *ad nauseam*, and published to the world, our example has been but little followed on the Continent. It cannot be, however, that this *quasi* reproach can apply much longer.

CHAPTER LXXV.

ON THE CAUSES OF DEATH IN OVARIAN DISEASE, WITH AN ANALYSIS OF EIGHTY-EIGHT CASES.

As a contribution to a better understanding of the natural history of ovarian disease, I have been led to make a brief inquiry into the causes of death, and have for that purpose instituted a careful collection and analysis of all such records as have been preserved in the post-mortem room at Guy's Hospital. In this work I have had the valuable assistance of my friend, Dr. J. J. Phillips, and as the cases which he has tabulated appear to be of great value, I have added them as an appendix to the present work.

Eighty-eight cases have been tabulated, eight of which are described as being monocystic; 56 as polycystic, compound, composite or colloid; 16 as malignant, and eight as dermoid.

It will thus be seen that the so-called monocystic, which doubtless included some of the proliferous cysts, formed but a very small proportion of the cases tabulated—not more than 9 per cent. Another 9 per cent. were of the dermoid variety, and 18 per cent. of the cancerous; 64 per cent. of the cases coming under the single heading of the compound and cysto-sarcomatous tumours.

Side Affected.—Of the 79 cases in which this fact was stated, 42, or 53 per cent. were of the left side; 23, or 29 per cent. of the right, and in 14 cases or 17·7 per cent. both organs were diseased. In nine of these 14 cases the disease was cancerous, in three fibro-cellular, and in two colloid—in all the disease being of the more solid kind. In only one other case out of the whole number was the second ovary in the slightest degree involved in the disease, and in that case there were only one or two small cysts upon its surface.

These facts somewhat differ from those given by other

other authorities. Indeed, Dr. Clay tells us that in his experience two-thirds of the cases of ovarian disease are of the right ovary, and one-third of the left; Mr. Wells, in one place, that the right and left ovary are diseased with equal frequency, and, in another, that in from one-third to one-half of the cases where death takes place from the disease both ovaries are affected. Drs. Scanzoni, West, and S. Lee, in their collective experience, assert that out of 415 cases the right ovary was diseased in 201 instances, the left in 148, and both in 66. These opinions were probably formed from examinations of the patients during life, and tend to shew how difficult a matter it is for even skilful men to form any definite opinion upon such a point.

In 76 cases, however, which were observed after death by Scanzoni, West, and R. Lee, 26 were of the right side, 23 of the left, and 26 of both; and Scanzoni, so late as October, 1865, (*British and Foreign Medical Chirurgical Review*, Oct., 1865), gave us the startling information that in the course of 14 years, out of 99 autopsies of ovarian disease, in 48 the disease was in one organ only, and in 51 in both; and upon this supposed fact he has based an argument of no mean weight against the operation of Ovariectomy, but it is to be remembered that Scanzoni has been an opponent of Ovariectomy from the first. It is impossible to reconcile the differences between these several results, but if the facts which I have given are correct—and I cannot doubt them—the rarity of finding disease of both ovaries in cases of simple ovarian disease seems very striking; and is of considerable value in a diagnostic point of view, for when this is the case it suggests the probability of the affection being of a cancerous nature, or of the doubtful fibro-cellular or colloid kind, simple cystic disease being rarely double.

The social condition of the patient.

This fact has only been registered in 36 cases, of which 25 were married and 11 single, nearly 70 per cent. having taken place in married women, and this point coincides with the observation of others, “that the disease is more frequent during the vigour of sexual life.”

The ages at which the patients sank.

			Monocystic.		Poly- cystic.		Can- cerous.		Dermoid.		Total & per cent.
Under	20	years	0	.....	4	.....	0	.....	0	.....	4 ... 4.7
Between	20 & 30		1	.....	16	.....	3	.....	3	.....	23 ... 27.0
„	30	40	4	.....	17	.....	5	.....	0	.....	26 ... 30.5
„	40	50	1	.....	8	.....	3	.....	1	.....	13 ... 15.4
„	50	60	1	.....	2	.....	4	.....	4	.....	11 ... 12.0
„	60	70	1	.....	4	.....	1	.....	0	.....	6 ... 7.0
„	70	80	0	.....	2	.....	0	.....	0	.....	2 ... 2.3
Total			8	—	53	—	16	—	8	—	85

The inferences to be deduced from the above table seem as trustworthy as those which can be obtained from others, which are composed to show the ages at which the disease was said to have appeared; and in some points of view, indeed, they may be said to be more reliable, for the event of death is an unmistakeable one, while that of the first appearance of the disease is only approximative.

The most interesting point is the early age at which the disease may make its appearance, and run its course; for four cases have been tabulated in which death took place before the age of twenty. Two were in girls aged respectively 15 and 16, who sank after tapping, from suppuration of the cyst. One was aged 18, who sank exhausted with a semi-solid growth; and the fourth case was aged 19, in whom the disease had existed for two years, and died from hæmorrhage into the abdomen, the direct result of paracentesis.

I may here mention that Kiwisch gives a case in which the disease appeared at 14 years of age, and that in the museum at Prague, there is a rare preparation of a cyst formation in a child only one year old. Kiwisch also opened the body of a foetus in which cysts were present in the ovary. It appears also, from the table, that the largest proportion of cases run their course between the ages of 20 and 40, that is during the active period of ovarian life; the number of cases gradually diminishing as age progresses.

Duration of the Disease.

This point has unfortunately only been noted in 36 examples, but the facts revealed in the analysis are very clear.

In 17 cases the disease has existed but one year.

10	„	„	between 1 & 2 years.
3	„	„	three years.
3	„	„	four years.

1, six ; 1, ten ; and in one sixteen years.

About 75 per cent. of these cases have run their career in less than two years.

On the Presence of Adhesions.

The fact of the presence of adhesions has been mentioned in 66 of the cases which have been tabulated. Of these—
 15 were visceral in 4 after tapping ; in 11 without.
 17 were parietal in 11 „ in 6 „
 5 were omental in 5 „
 29 were visceral & parietal in 12 „ in 17 „

From these tables it is quite clear that parietal and omental adhesions are frequent results of the operation of tapping, that they are found in 72 per cent. of the cases in which the operation has been performed, and in 27 per cent of those in which no such means of relief have been adopted. The difference between the two classes of cases being 45 per cent.

The causes of Death in Ovarian Disease.

CAUSES OF DEATH.	AFTER TAPPING.				TOTAL.	NO TAPPING.				TOTAL.	GRAND TOTAL.
	MONOCYST. POLYCYST. CANCEROUS. DERMOID.					MONOCYST. POLYCYST. CANCEROUS. DERMOID.					
1. Exhaustion ... ..	...	6	3	...	{ 9 or } { 22.2 p.c }	...	9	4	5	{ 18 } { 37.5 }	27 or 30.6 per cent.
2. Peritonitis	1	5	3	...	{ 9 or } { 22.2 p.c }	...	1	5	...	{ 8 } { 16.6 }	17 ,, 19.3 ,,
3. Suppuration of Cyst ...	2	11	...	...	{ 13 or } { 32.2 p.c }	...	...	...	...	{ 2 } { 4. }	15 ,, 17.1 ,,
4. Peritonitis and Suppuration of Cyst ... ..	...	4	...	...	{ 4 or } { 10. p.c }	...	...	1	...	{ 4 } { 8.3 }	8 ,, 9. ,,
5. Peritonitis from Perforation or Rupture of Cyst	...	3	...	...	{ 3 or } { 7.5 p.c }	...	...	...	3	{ 6 } { 12.5 }	9 ,, 10.2 ,,
6. Communication between Cyst and Viscera ... ..	...	1	...	...	{ 1 or } { 2.5 p.c }	...	4	...	...	{ 8 } { 16.6 }	9 ,, 10.2 ,,
7. Cyst Discharging Externally ... ..	...	...	...	...	...	...	...	...	...	{ 1 } { 2. }	1 ,, 1.1 ,,
8 Hemorrhage into Abdomen	...	1	...	...	{ 1 or } { 2.5 p.c }	...	...	...	...	...	1 ,, 1.1 ,,
9. Strangulation of Bowels	...	...	...	...	...	...	...	...	...	{ 1 } { 2. }	1 ,, 1.1 ,,
TOTAL	3	31	6	...	40	5	25	10	8	48	88 ...

In this table I have divided the cases into two sections—one showing the causes of death in all cases in which tapping had been employed, and the other in which the disease had been allowed to run its course without operative interference.

I have also shown the different causes of death in the four divisions of ovarian disease.

If we examine the above table with a little care several points of great interest present themselves.

It will be seen that of the eight cases tabulated as *monocystic*, four died from peritonitis or suppuration of the cyst, and that in three of these tapping appeared to be the direct exciting cause. In the remaining four cases, in which the disease was allowed to run its course, the cyst ulcerated into some portion of the intestinal canal; into the ileum in one case, and into the large intestine in three others.

Passing on to the *polycystic tumours* it will be observed that in the cases in which tapping had been performed peritonitis and suppuration of the cysts, either together or separately, was the cause of death in 72 per cent., exhaustion proving a cause in only 22 per cent.

The operation of tapping in these cases had evidently a direct influence on this result, and this would become more apparent in comparing the above causes of death, in this section of the table, with those given in the next in which no such operation had been performed. Thus in the first section causes marked 2, 3, and 4 were the cause of death in 64.4 per cent. In the second section they were the cause of death in only 28.9, the difference between the two being 35.5 per cent.

These facts seem to suggest that the operation of tapping cannot be regarded as very safe or expedient. It has its own risks, which should always be taken into account, having apparently been the direct cause of death in a large proportion of the cases in which it has been employed.

They seem to indicate that it should not be undertaken in a case in which the operation of Ovariectomy can be entertained, nor in any other, unless an urgent necessity exists; for it evidently hastens the end in not a few instances, by directly exciting peritonitis or suppuration of the cyst, or both combined.

CONCLUSIONS.

1. That nine per cent. of the ovarian tumours are apparently monocystic; nine per cent. dermoid; eighteen per cent. cancerous, and the remaining sixty-four per cent. polycystic or compound.

2. That 53 per cent. of the cases are on the left side, 29 per cent. on the right, and only 17 per cent. double.

3. That simple cystic disease of the ovary is rarely double, and that, when double ovarian disease exists, the majority of the cases are cancerous, colloid, or of the solid kind.

4. That about 70 per cent. of the cases are in married women, and that the disease is the most frequent between the age of 20 and 40, or during the vigour of sexual life.

5. That the disease runs its course, in at least 75 per cent. of all cases, within two years.

6. That in the *monocystic* tumours there is a greater disposition for the cyst to ulcerate into the bowels than in other cases.

7. That in 56 per cent. of the cases of cancerous disease, both organs are involved.

8. That in the dermoid tumours there is a greater disposition for the cyst to rupture than in all other forms of disease, death being directly due to this cause in 37 per cent.

9. That acute peritonitis and suppuration of the cyst as a direct result of the operation of tapping is by no means unfrequent; and that these causes of deaths are 35.5 per cent. more frequent when tapping has been employed than when the disease has been allowed to run its course.

10. That parietal and omental adhesions are 45 per cent. more frequent when tapping has been employed.

CHAPTER LXXVI.

THE STATISTICS OF OVARIOTOMY.

I HAVE deemed it right to devote a short chapter to the consideration of the statistics of Ovariectomy, and to give the results of the analysis of the cases I have been enabled to collect from British, American, and Foreign sources ; for I believe such results to be of undoubted value, not only being amply sufficient to prove the operation to be justifiable, but that through it a vast amount of suffering has been relieved, and many lives have been restored to usefulness and happiness.

I am not, however, disposed to overrate the value of these results, nor do I place too much confidence in statistical information. I am quite aware that too much has often been made of the statistical argument, and am likewise persuaded that the question of operation or no operation in any individual case is not alone to be decided by the information we may thus acquire ; nevertheless, I feel that it is on statistical grounds, and such alone, that the justifiability of this or any operation is to be permanently established.

If men expect too much from statistical information, or employ it for other purposes than those for which it is intended, the fault should not lie with the information, nor with the means by which it has been obtained, but rather with the men who use it unfairly and look for guidance from it where such is not to be found. The very men who are the most apt to abuse or sneer at statistical results are the most prone to pride themselves on their practical experience and knowledge. Yet they seem to forget that this practical experience and knowledge—if worth anything—is something definite ; that it must, by its weight and character,

tend to the formation of a definite opinion, or to suggest or indicate some plan of treatment. It may, perhaps, do something to show that a certain opinion is correct, and another wrong; that this plan of treatment is likely to prove successful, and that that will prove the reverse; yet they seem to forget that this very experience is in reality statistical, that it is based on what has been learnt before, that it is the result of their so-called experience; and it may be asked, if this experience of one man be of value, is not that of more greater?—is not the accumulated experience of many men on any single point—where it can be collected—of still greater weight? Unquestionably it must be, if the information be worth anything, or is other than a vague impression; for, I take it, no man would sanction a plan of treatment in any case when he knew from personal observation, as well as from the collective experience of his contemporaries and predecessors, that it had always failed, and that the conditions under which it was now to be tried were no more favourable for success than they had been when it had been tried of old. If in a surgeon's own hands a certain operation had never succeeded, he would, after a time—to be determined by his sensibility or judgment—cease to care about its performance, and if his ill success continued he would in the end look upon the attempt as hopeless, if not unjustifiable; if he knew the same unhappy result had attended the practice of others, in whom he had confidence, this opinion would naturally be much strengthened, and if he learnt by reading and research that it had always followed upon the practice, whenever and by whomsoever it had been attempted, he would, without doubt, conclude that the operation was unjustifiable. Yet this result has been arrived at through cumulative evidence, and through statistical information. In such a sense statistical evidence becomes of use in the guidance of a surgeon in the treatment of an individual case, and, although it may be depreciated, it is daily used even by its enemies. If it be misused, or applied to other purposes than those to which it is adapted, let the ooms rest on the men who misuse it, rather than on the information itself; if from it an argument is sought where it is not to be found, let the seeker be blamed.

To the subject under our immediate consideration this argument has its application, for, I take it, it is by the statistical information which we possess that surgeons have at last been led to entertain the operation of Ovariectomy, and to look upon it as justifiable. The ill success which attended upon its first performance was certainly enough to frighten men from its adoption; and the good success which has of late years attended its practice has at last convinced the majority of men that it *may* be performed under some circumstances, and that it ought to be under others. The logic of facts—of statistical facts—has had its weight, and by it the operation of Ovariectomy has been established.

The old cry against statistics that they are untrustworthy is not now worthy of refutation—that they represent only the collected examples of successful operations is an opinion which few men would now assert. It may be true that there is a difficulty in extracting from some operators any definite expression of the results of their experience; and it is fair, therefore, to believe that such experience must be bad, and little in favour of the operation they had undertaken.

Still, on the other hand, it is only right to believe that the information which has been given by honourable men is correct and true as far as it goes, and it is upon such alone that our results have been obtained. The men who hold back their cases are happily in the minority, and their experience would probably add but little to our professional knowledge.

Let us now refer to the statistics which have been accumulated. They have been compiled from every available source, and include all the published cases up to December, 1866. Each British case has been referred to in its original page of publication, recent additions have been made, and every source of error has been carefully guarded against.

The names of those who have operated on ten or more cases have been quoted, but the examples of others have been grouped together, the number of cases being fairly sufficient for statistical purposes.

The cases have been subdivided into British, American, French, and German, the few examples which have taken place in other countries being placed together.

I must add that the carefully compiled tables of Lyman,

Clay, Peaslee, and Dutoit, have been advantageously employed.

The first table represents the whole body of cases which have been collected; it contains the names of gentlemen who have operated on ten or more examples, with the results. The names of those who have operated on less than ten cases have been omitted, their cases being grouped together.

TABLE I.
STATISTICS OF COMPLETED OPERATIONS.

Name of Operator.	Number of Cases.		Recoveries.		Deaths.	
BRITISH.						
Mr. Spencer Wells	150		103		47	
Dr. Charles Clay	110		76		34	
Mr. Baker Brown	107		72		35	
Dr. Keith	48		37		11	
Mr. Thomas Bryant	28		17		11*	
Dr. Tyler Smith	20		16		4	
Dr. F. Bird	12		8		4	
Mr. Lane	11		8		3	
Other Cases	172		98		74	
Total British		658		435		223
AMERICAN Cases.....	86		51		35	
Dr. W. L. Atlee	19		10		9	
Mr. Dunlap	12		7		5	
		117		68		49
FRENCH Cases	41		23		18	
Kæberlé.....	18		13		5	
		59		36		23
GERMAN Cases.....	55	55	15	15	40	40
Other Countries	11	11	6	6	5	5
Total Foreign.....		242		125		117
Grand Total		900		560		340

An analysis of this Table shows that out of—

	RECOVERED.	DIED.
900 Cases	560 or 62.3 per cent.	342 or 37.7 per cent.
658 British Cases ...	435 or 66.2 per cent.	223 or 33.8 per cent.
242 Foreign Cases ...	125 or 51.7 per cent.	117 or 48.3 per cent.

* In two of these cases both ovaries were removed.

TABLE II.

SHOWING THE RESULTS OF ALL SUCH OPERATIONS AS HAVE BEEN INCOMPLETE FROM EITHER A FALSE DIAGNOSIS, THE PRESENCE OF STRONG ADHESIONS, OR OTHER CAUSES.

From *Dutoit*.

	Total.	Recoveries.	Deaths.	Mortality per cent.
Partial extirpations.....	27	11	16	59.3
Abandoned operations.....	87	61	26	29.8
Other Tumours, Uterus, &c.	20	7	13	65.
Abandoned from false Diagnosis	23	16	7	30.4
Grand Total	157	95	62	39.4

Conclusion.—That the partial extirpation of an Ovarian tumour is one of great danger, the mortality of such cases showing a difference of 21.6 per cent. over completed operations, and that those abandoned on account of unexpected difficulties or false diagnosis, are less fatal than the average examples of Ovariectomy.

TABLE III.

SHOWING THE CONDITION OF THE PATIENT AT THE TIME OF THE OPERATION, AND ITS EFFECTS UPON THE RESULT.

	Total.	Recoveries.	Deaths.	Mortality per cent.
Health good	83	52	31	37.3
“ impaired	89	47	42	47.2
“ much broken	103	51	52	50.4
Grand Total	275	150	125	45.4

The results obtained by this table are only such as would have been expected. The better the health of the patient when the operation is performed, the greater are the chances of securing a good result, and *vice versa*.

As a practical conclusion, it may therefore be asserted that the patient's health should not be allowed to suffer, or become impaired before the question of operation has been decided, and as soon as evidence appears that such is the case, the expediency of Ovariectomy should be entertained, for by delay nought but evil is to be expected.

The next table is calculated to show the effects of the influence of age in the operation. It contains an analysis of 575 cases of complete Ovariectomy, with the results.

TABLE IV.

SHEWING THE INFLUENCE OF AGE ON THE OPERATION.

Age.	15 to 20	-25	-30	-35	-40	-45	-50	-55	-60	-65	70 & up- wds	Total.
Recovered	29	54	53	57	43	32	34	19	17	6	1	345
Died	17	29	45	33	33	24	18	14	12	5	0	230
	46	83	98	90	76	56	52	33	29	11	1	575
Mortality p. ct.	36.9	34.9	45.9	36.6	43.4	42.8	34.6	42.4	41.3	45.4	0	40.

No very definite conclusion is to be drawn from this table ; yet it would appear that the operation is more successful in early than it is in advanced life, and this conclusion coincides with all preconceived ideas of what is probable. It also seems that between the ages of 45 and 50 the operation is as successful as it is at any other period. This point is one of great interest, for it seems to indicate that the period of life at which the functions of the ovaries have disappeared, and their physiological action as glands has entirely ceased, is as favourable a one to choose for the performance of Ovariectomy as early adult life ; that it is a better time for the operation than during the active period of the ovaries' existence, and than a later date, when life's powers are beginning to fail. It tends to show that the gland may be more fearlessly removed when its life of action has passed, and when it has ceased to be of import in the animal economy ; as long as life's powers are still intact and the feebleness of age has not appeared.

TABLE V.

SHOWING THE CHARACTER OF THE TUMOUR IN 500 CASES, WITH THE RESULT OF THE OPERATION.

	Tumours said to be Monocystic or nearly so.	Polycystic or Multilocular.	Solid or semi-solid.	Total.
Recovered	67	191	20	278
Died.....	35	162	25	222
Totals	102	353	45	500
Mortality per cent.....	34.9	45.8	55.5	44.4

The careful consideration of this table leads us to the following conclusion :—

The simpler the nature of the tumour the safer is the operation for its extraction, and, in proportion to the solidity of the growth, appears to be the danger of Ovariectomy ; the gradations of danger being progressive and the difference between the extremes so great as 20 per cent.

TABLE VI.

SHOWING THE EFFECTS OF PREVIOUS TAPPINGS ON THE OPERATION OF OVARIOTOMY.

From *Dutoit*.

						Recovd.		Died.	
Of 45 cases in which no Tapping has been employed						...	31	14	or 31 p.c.
Of 206 cases in which one or more Tapping had been employed						...	113	93	or 45
<hr/> 251						<hr/> 144 107 or 42.6. <hr/>			
	Total.		Recoveries		Deaths		Mortality		
One Tapping	85	...	50	...	35	...	41	per cent.	
Two Tappings.....	43	...	24	...	19	...	44	1 per cent.	
Three to Nine Tappings	51	...	27	...	24	...	47.	per cent.	
Ten or more Tappings	27	...	12	...	15	...	55.5	per cent.	
Grand Total	206	...	113	...	93	...	45.	per cent.	

It would thus appear that cases of Ovariectomy do better when the operation of tapping has not been previously performed, and that the mortality increases with the number ofappings. But it must be borne in mind that as a rule the cases in which there is no necessity for tapping are by far the simplest, and that those in which one or more such operations have been required are often complicated and more commonly associated with a feebleness of power than the former class of cases. In a case in which a doubtful diagnosis exists a single tapping is of great value ; but where the diagnosis is clear and the desirability of the operation of Ovariectomy has been decided upon, as a broad rule it is better not to tap—but to operate—when the time has arrived in which it is evident something must be done for the patient's relief.

TABLE VII.

SHOWING THE EFFECTS OF ADHESIONS ON THE RESULT OF THE OPERATION.

		<i>Dutoit.</i>			Mortality	
		Total.	Recovered.	Died.	per cent.	
No Adhesions	...	135	97	38	or	28.1 per cent.
Slight	...	153	93	60	or	40 ,,
Extensive	...	204	105	99	or	48.5 ,,

It is tolerably evident from the above table that the complication of adhesions is a very serious one. The figures which have just been given clearly show a difference of 20 per cent. in the mortality of cases in which extensive adhesions existed, over those in which no adhesions had to be torn through. Simple parietal adhesions are not, however, much to be dreaded, but those connected with the viscera or pelvis are of serious importance.

TABLE VIII.

SHOWING THE CAUSES OF DEATH AFTER THE OPERATION.

		<i>From Dutoit.</i>	
Collapse.....	41 cases	Breast affection	5 cases
Hæmorrhage.....	31 cases	Brain do.	1 case
Peritonitis	91 cases	Diabetes	1 case
Phlebitis	2 cases	Not Stated	26 cases
Tetanus.....	4 cases		
Affection of Bowels	11 cases	Total	218 cases
Abscess.....	5 cases		

CONCLUSIONS.

1. That the mortality of the cases of completed Ovariectomy is 37.7 per cent. ; that of British cases being 33.8 per cent. ; of foreign, 48.3 per cent ;

2. That the mortality of the cases of *incomplete* operations is very great, the statistics showing a difference of 21.6 per cent. over those completed. But that operations, abandoned on account of unexpected difficulties or false diagnosis, are less fatal than the average examples of Ovariectomy.

3. That the better the health of the patient, when the operation is performed, the greater are the chances of securing a good result, and *vice versa*.

4. That the operation is *more successful in early* than it is in *advanced life*, and that between the ages of 45 and 50, when the functions of the ovaries may be said to have ceased, it is as successful as it is at any other period, as long as life's powers are still intact, and the feebleness of age has not appeared.

5. That the *simpler the nature of the tumour* the safer is the operation for its extraction ; and in proportion to the solidity of the growth appears to be the danger of Ovariectomy ; the gradations of danger being progressive, and the difference between the extremes being so great as 20 per cent.

6. That cases of Ovariectomy do better when the *operation of tapping* has not been previously performed, and that the mortality of the operation increases with the number of tapplings.

7. That the *complication of adhesions* is a very serious one, statistics clearly showing a difference of 20 per cent. in the mortality of cases in which extensive adhesions existed, over those in which no adhesions had to be torn through. Simple parietal adhesions are, however, of far less importance than visceral and pelvic.

8. That collapse, hæmorrhage, and peritonitis are the chief causes of death after the operation.

CHAPTER LXXVII.

WHEN AND UNDER WHAT CIRCUMSTANCES SHOULD THE OPERATION
BE UNDERTAKEN ?

HAVING decided that the operation of Ovariectomy is justifiable under some circumstances, and desirable under others, it will be well to turn our attention to the question stated at the heading of this chapter, and to consider what those circumstances are, under which it should be undertaken, and what cases are the best adapted for the practice.

Are all examples of ovarian diseases to be treated by extirpation?—if not, which are to be selected? At what period of the progress of the disease should the operation be performed?

These questions naturally occur to the minds of all men who are interested in this subject; and I propose now to pass on to a brief consideration of these points.

What Cases are to be selected for Operation?

The very statement of this question seems to imply that the operation of Ovariectomy is not suitable in all cases of ovarian disease, and that there are some to which it is quite inapplicable—for choice implies variety, and, as a consequence, selection—and this leads us to consider what are the different forms of ovarian disease? For surgical purposes, it is sufficient to divide these cases into the *simple* cysts, and the *compound*,—the former being composed only of one cavity, the latter of many—solid material being almost always present, though varying in amount.

In the simple or *monocystic* ovarian tumours, when the diagnosis is clear, there are, doubtless, other plans of treat-

ment open to the surgeon than Ovariectomy; and amongst these, the treatment by injection of iodine stands foremost. In the hands of different men it has had variable success. M. Boinet tells us that out of forty-five patients suffering from this disease thirty-one were cured, five had relapses, and nine died; Dr. Simpson has performed it in about twenty cases with good success, one case only dying; and Dr. Tyler Smith tells us that out of ten cases in which this practice was followed two only were satisfactory, and two died. Dr. West had one cure in eight cases.

Still, this plan of treatment does not generally meet with much favour, for it is uncertain. In exceptional cases it may cure, but in the majority it does no good, and may even be followed by a fatal result: relapses after its employment appear to be very frequent, and in this element of uncertainty lies its greatest fault.

It is only applicable also to the simple cases of monocystic disease; it is quite inapplicable and useless in the multilocular tumour, and where solid growth exists; and here the diagnosis between the two forms of disease comes under consideration, a question undoubtedly of some difficulty.

For a simple ovarian cyst, uncomplicated with the development of smaller cysts within its walls, and unassociated with any solid growth, is unquestionably a somewhat rare affection. That such cysts are occasionally found there is little doubt—examples have fallen under my own observation—but they are not common; the majority of the cysts which appear to be simple, possessing the remarkable power of reproducing other cysts within their walls, being, as Mr. Paget originally describes them, proliferous cysts; and, during life, it may be stated to be an impossibility to form an accurate diagnosis between the two varieties.

Amongst the cases which have been tabulated as monocystic tumours—only nine per cent. of the whole number—are, doubtless, many of the proliferous kind, and in these the treatment by injection is not to be advised.

Still, to the surgeon's mind, the treatment by iodine injection should always be entertained in every case of apparent monocystic ovarian disease, the circumstances of the individual cases determining what course should be taken.

Of the *fibrous or solid* tumours of the ovary little need be said; they seldom develope to any size, or interfere with the patient's comfort to any great extent, and the expediency of their removal has rarely to be entertained by the surgeon. Should they, however, by their size become cumbersome, the expediency of their removal must be entertained, and decided upon as in other cases.

In all other forms of ovarian disease, in the *multilocular or polycystic*, composite, adenoid or cysto-sarcomatous, as they have been variously called—in all those, in fact, which are made up of many cysts, and of a variable quantity of solid material—these cases forming the bulk of those coming under observation—there is no treatment which appears to be of any material benefit, none which seems to have any influence in retarding the growth of the disease, in palliating its inconveniences, or averting its end. The treatment by iodine injection is obviously inapplicable, and there is nothing else which offers any prospect of doing permanent good; the patient must quietly submit to her fate, or to the alternative of an operation; and in these cases, bearing “the stamp of incurability upon them,” the question becomes necessarily narrowed.

By means of the operation of tapping, a patient may obtain relief, but it is only temporary; within a brief period, and at uncertain intervals, the operation will have to be repeated, and by repetition of such means existence may be prolonged, but in the majority of cases this prolonged existence is a miserable one, and the intervals of so-called ease are, at the best, uncertain. Tapping is also at times a fatal operation, in rare instances from hæmorrhage into the abdomen, but more frequently from acute peritonitis and suppuration of the cyst; these causes of death being 35·5 per cent. more frequent when tapping has been employed than when the disease has been allowed to run its course.

It is to be observed, also, that in all cases of tapping, parietal adhesions, if not visceral, are almost certain to take place, and in the analysis of fatal cases this fact is well demonstrated. Under these circumstances, is the operation of tapping to be recommended in such cases of ovarian disease as appear to be favourable examples for the operation of Ovariectomy?

Without doubt, in the majority of cases such an operation had better not be performed. For *diagnostic* purposes it may be employed with confidence and with good effect, for it is better to run the risk of causing the formation of adhesions, and even of death, by the operation of tapping, than to submit a patient to the dangers of Ovariectomy, when the nature of the case is not clearly understood, and the propriety of the removal of the growth is surrounded with doubt; but under other circumstances, it is by no means advisable to have recourse to the practice.

When a patient has attained the point in which it is evident something must be done for her relief—when the diagnosis of the disease is clear, and there are no points in the case which contra-indicate the capital operation of Ovariectomy,—it is by far the safer practice to operate at once than lose time, which may be of value, or to risk causing the formation of adhesions, which are always evils, by any such temporizing means as that of tapping. For diagnostic purposes, the operation of paracentesis abdominis is one of great value in certain cases, as it is in others in which relief is a necessity, and the operation of Ovariectomy is inexpedient or inapplicable; but under other circumstances, tapping is a mistake, and should be avoided.

Are all cases, therefore, of polycystic tumours of the ovary to be excised; and, if not, which should be rejected? It has been already shown that there is no hope of doing permanent good to any patient labouring under this disease by any special treatment, for there is no remedy which can be trusted to retard the growth of the tumour, or to arrest its progress. There is no operation, also, less than that of extirpation, which offers any prospect of affording permanent relief,—none which can be looked to with any hope of benefit. Still, there are forms of multilocular ovarian disease which it would be unwise to touch; others with which it would be quite unjustifiable, and amongst them the cancerous tumours stand pre-eminent. It is true, there is great difficulty in forming an opinion upon this point, upon making a diagnosis as to the existence of such a cancerous growth. Still, an approach to certainty may be made, a fair probability can be attained. It is not, however, to be made out by any local examination alone; as far as my own expe-

rience goes, there are no definite local symptoms by which a solid or semi-solid multilocular cancerous ovarian tumour can be diagnosed from a solid or semi-solid multilocular benign one; as a rule, in their chief local features these forms are not to be distinguished, although, perhaps, in rare examples of the cancerous the general outlines of the growth are more irregular or nodular. The suspicion of its cancerous nature is only to be roused by the general condition of the patient, and the natural history of the case; in the cancerous there will be, as a rule, more emaciation, more wasting and rapid constitutional decay than in the benign. The disease will, as a rule, run its course more rapidly, although the size of the tumour will seldom be so great as in the simple cystic form. Still, this rule has many exceptions, for the cancerous tumour of the ovary is very commonly a cystic disease, and there are no reasons why these cysts should not enlarge as much in the malignant form of ovarian disease as in the simple; in practice this is found to be the case. When solid, however, and uncomplicated with cysts, the cancerous tumours rarely attain a great size. It has been said that the œdema of the abdominal walls may be looked upon as a useful guide to indicate the cancerous nature of ovarian disease, but my own personal experience tends to prove that such is not the case; for in those instances in which this symptom has existed to the greatest extent, and to the most marked degree, there has been little doubt as to the benign nature of the disease, for the tumours have all been of many years' duration; one, indeed, of eight, another of twelve, and another of at least thirty years. In these three extreme examples the thickness of the œdematous integument over the lower part of the abdomen might have been calculated by inches, and the œdema of the skin showed itself in vesicular swellings, varying from that of a pea to a large grape. In all these cases tapping in the median line of the abdomen, or, indeed, in front, was out of the question, and a lateral position had to be selected. The pelvic examination may be of value in these examples, and if the organs are found to be somewhat fixed and immovable, instead of being free and mobile, the probability of the growth being of a cancerous nature is much increased, for the disposition to cause infiltra-

tion of the neighbouring parts is as common in cancer of the ovary as it is in cancerous affections of other parts. There is another point also which deserves notice, and that is the disposition there is in cancer of the ovary for the disease to involve both organs. Amongst the fatal cases it will be seen that out of fourteen examples of disease of both ovaries, nine were cancerous; and among the cancerous cases there were only seven examples, or forty-three per cent., in which the disease was single—the law of symmetry being observed in this as in other forms of constitutional disease. Under such circumstances a careful pelvic examination is a matter of great importance, and under no conditions should it be omitted, for by such means alone are these points to be made out in a large proportion of cases.

Are all Cases of Benign Multilocular Ovarian Tumours then to be excised?

There is no doubt as to the answer which must be given to this question, for by no other means than the extirpation of the growth can a woman be relieved of such an organic disease. The patient must be left alone to bear the inconvenience of the ovarian tumour, to endure the living death of its matured miseries, and to die, worn out and exhausted by the prolonged sufferings produced by its presence; or she must run the risk of the capital operation at one time or other in the progress of the disease, and submit to Ovariectomy.

Before, however, we proceed to consider at what period of the tumour's growth it is desirable to undertake its extirpation, it will be well to look back to the natural history of the disease, and enquire,—what are the chances of life for a patient who is left alone?—how long may life be prolonged under favourable circumstances?—what is the average period in which ovarian disease runs its course?

It is needless to quote numerous authorities in discussing these points, for all men are tolerably agreed that the average duration of life of those who are the subjects of ovarian tumours, when the disease is allowed to run its course, is two or, at the utmost, three years; that few live over four, and that those who survive beyond that period must be looked upon as exceptional instances. In my own cases seventy-five per cent. ran their course within two years.

“Taking everything into consideration,” says Dr. Graily Hewitt, in his admirable work on the diseases of women, “we shall not be far wrong in drawing from the published cases of Dr. Lee and Mr. Safford Lee the conclusion that the probable duration of a case of ovarian disease of progressive character is, in 85 or 90 per cent. of the cases, two, or at the most three years; of the apparently ‘stationary,’ or chronic cases, the progress is more favourable, but in such cases the disease is liable at any moment to start into fresh activity. The first question we naturally put to ourselves when a case of the kind comes before us for decision is,—Does this case belong to the fortunate series, the 10 or 15 in the 100? or is it one of the 90 who must die in the course of two or three years if unrelieved?” To the surgeon, however, this question is not of so much importance, for it is not till the tumour has become by its growth so large as to raise the question of operative interference that the answer has to be given, and at such a stage of the disease, this becomes of little value.

Having clear ideas, consequently, on this important point, we may ask ourselves at what period of the tumour’s growth should the operation of Ovariectomy be entertained? And with all deference, I do not believe it difficult to answer this question, for it certainly should not be entertained when the tumour remains small, and is causing little or no mechanical inconvenience, and under these circumstances no surgeon would be justified in submitting a patient to this operation who may be in sound health, well able to perform all the duties of life, and enjoy fairly its pleasures.

Ovariectomy should not be thought of when the patient’s general condition of health is very bad or the powers feeble,—when there is any evidence of disease in any other organ than the ovary,—when, indeed, it is tolerably evident that the powers of life are unable to withstand the shock of the operation, and seem incapable of rendering the needful reparative assistance for the recovery of the case.

It is no more to be entertained, under these circumstances, than would any other capital operation, for the same principles which guide the surgeon in the ordinary conduct of his pro-

professional career are applicable when the subject of ovarian disease is under consideration, and should be scrupulously adhered to in the practice of all operations.

It is true that a surgeon is sometimes led to perform an operation in almost desperate cases, when suffering is severe, and death is certain if the patient be left alone, although the scientific probability of saving life is almost *nil*, such as in neglected hernia, in certain examples of amputation for disease or accident, in the ligature of a vessel or the excision of a tumour. Still, it is in exceptional examples of disease or injury that such operations are performed, and when there is a possibility of success being obtained by an operation, and none without. Under like circumstances, a surgeon may be called upon to perform Ovariectomy ; when a patient is evidently being worn out by the disease, and by it alone ; when life's tortures are not worth prolonging, and death can be calmly looked at and even wished for ; when there is a scientific possibility that, on the removal of the local disease which is clearly destroying life, the powers of the patient may rally, and that at any rate relief to suffering will be secured ; under such conditions, an operation may be admissible. With the aid of chloroform the operation is rendered painless, and it is certainly true that the after pains are, as a rule, marvellously little, for I have heard patients frequently say that the pains after the operations are rarely so severe as the pains before. Under certain circumstances, consequently, the surgeon may be justified in performing Ovariectomy with the object of giving relief, when only a scientific possibility exists of doing more, in the same way that he may be justified in doing any other operation, with the same object and a like slender hope.

We have hitherto briefly explained when the operation is not to be undertaken, and shown when it may perhaps be justifiable in extreme cases, but the surgeon should watch himself carefully in such desperate cases, and not be led to undertake them without much anxious thought and earnest consideration, for operations undertaken with no reasonable prospect of success, and with the bare hope of doing good, are palpably unjustifiable, unscientific, and inhumane—they degrade the surgeon and injure the profession. The public

derive no benefit from the experiment, and the character of operative surgery necessarily suffers, for it is well to bear in mind the sarcasm of Cruveilhier, that “even success does not always justify rash enterprises.”

Let us, however, return again to our original point, and inquire into the circumstances under which the operation of Ovariectomy should be undertaken in the majority of cases, and after what has been written, the answer to this question can hardly be regarded as a difficult one. For if the reasons already given for the rejection of the operation are to be regarded as correct, it is tolerably clear that it is to be thought of only when the tumour has, by its size, become cumbersome, interfering with the comfort and curtailing the powers of the patient to perform the duties, and enjoy the pleasures of her ordinary existence; when it is beginning to interfere with the natural functions of the frame, and impair the efficiency of the patient's powers; when the general health is becoming affected, and the local effects of the disease distressing; under these circumstances, and under these alone, the question of operation is to be considered, and, if permissible, it is to be undertaken.

CHAPTER LXXVIII.

ON THE OPERATION OF OVARIOTOMY.

BEFORE we pass on to the consideration of the operation of Ovariectomy, it may be well to inquire into the necessity of adopting any special treatment in the preliminary preparation of a patient who is about to pass through such an ordeal ; for some authors have led us to believe that in this point of practice there is some special power, and that success or non-success in the ultimate result of this operation, may be determined by the care with which the preliminary treatment has been carried out. . For my own part, I must confess that I have failed to recognise the necessity of adopting any such line of practice. The principles by which we should be guided in the preliminary treatment of a patient about to undergo the operation of Ovariectomy need not differ in any way from those which experience has taught us to be called for previous to any other capital operation. We should do our best to raise the standard of health by all those general hygienic and tonic influences which are well known to act beneficially towards the attainment of that end, such as good air, simple, nutritious diet, a fair amount of stimulants, and the administration of some tonic. Let the patient take exercise when she can without pain, but take care that it is kept within the limits of fatigue, that it is on level ground, and that no shaking or straining be on any account allowed ; and when she is at rest let the half-reclining position be the one usually assumed. For a day or so before the operation, however, exercise, even when possible, is not to be advised, for quiet and repose are doubtless then of some essential service.

As a tonic medicine, iron appears to be of real and important value ; it seems to have an influence for good which other

tonics do not possess. It is no more useful, however, before the operation of Ovariectomy than it is before any other capital operation, but it is as good. I have often thought that in hospital practice wounds are less prone to inflame, and that erysipelatous affections are less common under the influence of this medicine than when no such preliminary remedy had been administered. In peritoneal operations this point is of primary importance, and, as a consequence, the adoption of this practice is one to be recommended. The form of iron I prefer is the tincture of the sesquichloride, twenty drops of which, combined with a like quantity of chloric æther, or of syrup of lemons, in water, form a pleasant draught.

The bowels of the patient should be gently opened two days previously by a mild aperient, such as castor oil, or the saline rhubarb powder of the Guy's pharmacopæia, and on the morning of operation the large intestine should be washed out with a warm water enema, but nothing like powerful purgation should be allowed under any consideration. Care should also be observed that the catamenial period has passed for at least a week previous to the operation; for all ovarian excitement is necessarily injurious at such a time, and should be avoided. I have known of cases of Ovariectomy being undertaken without any consideration of this point, and believe that an untoward result is to be expected under such circumstances.

In Hospital practice the patient should be isolated as much as possible from all others, and a private room, if possible, obtained, in which good ventilation exists; a special nurse should also be secured, who is not only entirely trustworthy, but one who understands the use of a female catheter without fumbling.

In private practice the patient's own house is the best place for the operation to be performed, and country patients should not be brought into town unless an urgent necessity exists; for there is little doubt that the air of a large city is not so conducive to the rapid reparation of a wound as fresh country air. In abdominal surgery this influence for good is of great value, and should not be thrown away unless from necessity.

The Surgeon who is to operate, and his assistant, should

not allow themselves, for a few days before the operation, to visit the post mortem or dissecting room, nor should they handle any morbid preparations. Erysipelatous affections and all contagious diseases should also be shunned as much as possible; indeed, the same rules which are observed by the careful obstetric practitioner are applicable to the surgeon who undertakes the operation of Ovariectomy; for the same subtle poisons which are fairly recognized by all to be hurtful to the puerperal woman, act with equal force upon the subject of ovarian disease, when submitted to Ovariectomy, and, as a consequence, should be conscientiously avoided.

It follows, therefore, that, as regards the lookers-on at an operation, and all who may come into contact with the patient, none who may bring infectious or contagious disease to the bed-side should be on any account admitted. The physician who is attending a case of puerperal fever, is looked upon as a possible poisoner, as far as concerns the puerperal woman. The medical attendant of a scarlet fever case, of erysipelas, or of other contagious disease, should be regarded in the same light in the presence of an Ovariectomy operation, and should be excluded. Hence it is, that in Hospital practice, great care is needed to exclude all such possible means of injury as I have just briefly enumerated.

The surgeon and his assistant should strenuously observe the rules I have just laid down. He should admit into the operating room only such senior men who have, as it were, subjected themselves to the required quarantine rules to which I have alluded, and the spectators who come from without the hospital walls should be closely questioned as to their freedom from contagious influence. He should not only be sure that he is himself free from all possible sources of evil contagion or infection, but he should take care that all who come in contact with, or within the sphere of influence of his patient, are declared clear from morbid material.

I need hardly allude to the necessity of all bed and bedding, blankets, sheets, and hangings being perfectly fresh; that all sponges should be *new*, soft, well cleansed and scalded, free from soap and all grit; that flannel, when wanted, should be fresh, having been previously well washed in warm water;

and that every instrument employed should be scrupulously clean. The hands of the operator should be thoroughly cleansed from soap just previous to the operation, and should be well warmed, for manipulation with a cold hand cannot but prove injurious to an exposed peritoneum. In Dr. Peaslee's mind this fear of irritation from the handling of the intestines and peritoneal membrane, is so great that he bathes his hands with a preparation which he calls an artificial serum—composed of water four pints, white of egg six drachms, and salt four drachms. This practice has not, however, been followed by any other operator.

The Temperature of the Room in which the Operation is Performed.

There is still some difference of opinion upon this point, between operating surgeons, Dr. Clay, of Manchester, Peaslee, of America, and others, advising that the operating room be heated to degrees 75 or 80, and a good supply of moisture engendered by the diffusion of steam. Other surgeons make no such rule. And speaking from my own experience I have no faith in the adoption of such a practice. I would have the room heated to a comfortable temperature,—that of 65 degrees is amply sufficient. A greater heat acts as a powerful depressant upon the patient, and can do no good. A warm room with good ventilation is what I have always striven for, in preference to a hot one with closeness. A cold damp room is unquestionably to be condemned.

The Position of the Patient.

The horizontal position is one that patients suffering from ovarian disease can rarely assume, and when the tumour is so large as to require Ovariectomy, it becomes almost an impossibility. As a consequence, the half-reclining position is the most comfortable for the patient who is about to undergo Ovariectomy, and quite as convenient for the operating surgeon. It is the posture I have invariably adopted in the cases which have fallen into my hands, and I know of no good reason why it should be altered. Some operators have employed the sitting posture in preference to any other on

account of the facility with which the tumour can be removed through the abdominal incision, and also on account of the advantage it gives in preventing the escape of the ovarian cyst-contents into the abdominal cavity. For the same reason Mr. Hutchinson prefers the patient to be turned partially on her side, but both these postures are not only inconvenient to the operator, but have other real objections, which forbid their recommendation. The chief objection rests, however, on the fact that the same law of gravity which acts upon the tumour and its contents, facilitating its escape from the abdominal cavity, and allowing it to tumble out when the incision is made, acts as powerfully upon the abdominal viscera, and thus the disposition which always exists for the intestines &c., to escape through the abdominal section is greatly increased, and the danger of excess of manipulation of these parts is much aggravated; the difficulties of the operation are also increased. The tumour may fall out, also, too rapidly, and, by causing a too sudden and unexpected strain upon the pedicle, a severe and perhaps fatal rupture of some important part may take place. This evil is no slight one, and, as an argument against the practice, is of some force. Upon the whole, the advantages said to be gained on one side are thus counterbalanced by disadvantages, and are more than neutralized.

The half sitting, or semi-recumbent position affords all the advantages which have been claimed for the others to which I have alluded, without their evils, for in it the tumour can readily be removed from the abdominal cavity, and, with care, its fluid contents can, without difficulty, be prevented from passing into the peritoneal cavity. There is, also, abundant room for every manipulative act that can be called for.

The Administration of Chloroform in the Operation and Local Anæsthesia.

Amongst the many incidental advantages which the introduction of chloroform has afforded beyond that of relieving pain, there are few greater than that to which I am about to allude, and which refers to Ovariectomy, for there can be little doubt that the success of the operation has been greatly influenced by the use of this anæsthetic.

It is true that operations for the removal of an ovarian tumour were undertaken before the introduction of any anæsthetic, but we all know how fatal were their results, and how exceptional was a recovery. Those who had an opportunity of witnessing the performance of an operation under such unfavourable circumstances, can hardly wonder that so many examples succumbed to the practice, although they might that any were found to convalesce.

To see a patient writhing under the agonies of an abdominal section was enough to make the hardest heart turn with horror, and to witness the surgeon's hands within the abdomen of a struggling woman, in his endeavour to remove an adherent growth, was almost sufficient to make any professional spectator decide that such an operation was really unjustifiable.

For how was it possible for a surgeon to be quiet in all his movements, gentle in his manipulations, and thoughtful over the difficulties which, of necessity, present themselves in an ovarian operation, when the cries of the patient's agony stimulated him to expedition, and her struggles forbade gentleness. For all surgeons who have operated upon these cases will agree that success, even under favourable circumstances, is only to be acquired by attention to these points; that hurry in any operation is always bad and unjustifiable, but that in Ovariectomy it is destructive; that force is never to be employed in any case where art will answer; and that in Ovariectomy all blind force and dragging is to be strongly condemned; and that in a proceeding in which steadiness in operating, gentleness of manipulation, and thoughtful attention to every detail are absolutely essential to success, the safety of the patient must depend upon her quietness and passiveness under the surgeon's treatment.

Under these circumstances the value of chloroform as an anæsthetic cannot be too highly praised, for the patient is by it not only rendered insensible to pain, but her perfect quiescence is guaranteed, and her passiveness under the hands of the operating surgeon completely ensured. Is the same end, however, to be obtained by any other plan? Do we know of any other means by which the same advantages are to be acquired without any of its evils? Will local anæsthesia

equally answer the purpose? Without doubt the answer to these questions must at present be given in the negative. It is true that a case has been recorded in which Ovariectomy was successfully performed with the patient under the influence of local anæsthesia alone; but in this example no complication was happily present, and the manipulation required was but simple. But what would have been the end had some of those severe complications existed which are apt to embarrass the surgeon?—which require gentle manipulation to deal with, and time to treat?—in the treatment of which the absolute quiescence of the patient becomes a necessity? Under these circumstances would local anæsthesia have had any beneficial influence?—and with such contingencies before the surgeon is it justifiable to employ any partial means of doing good when more complete can be secured by the inhalation of some anæsthetic? For my own part, I believe the acquisition of a *general* anæsthesia to be an essential point of practice in the operation; for although in simple cases *local* anæsthesia may suffice, in the more complicated it would be fraught with danger; for no man can, in our present state of knowledge, tell beforehand with what complications he may have to contend.

In the practice of general surgery the prudent surgeon always enquires, before he operates, what are the *possible* contingencies which may arise in the progress of an operation, in order to ask himself and to answer how they are to be met; and when grave complications are even possible, he lays his plans calculating on the certainty of their presence. He is thus never taken by surprise, nor is he ever at a loss.

The careful Ovariectomist should not certainly be less prudent; he should always calculate upon the presence of difficulties, for their existence is uncertain, and be well prepared to meet them. He should not throw away the slightest chance of gaining a good end. He should not reject the double good which is acquired by a general anæsthesia, and avail himself of the single benefit which a local anæsthesia at its best affords, without some strong motive and a better reason.

It is true that in the vomiting which occasionally follows the use of chloroform we have an evil effect, which is greatly

to be deplored, and which is without doubt in a measure injurious; still I have never seen any positive bad result, which could have been attributed to the persistence of this symptom, nor do I believe any such exists. It is an evil which must be endured for a positive good. In the use of the chloroform mixture, of alcohol one part, chloroform two, and æther three parts, as recommended by the Chloroform Committee of the Med. Chir. Society, this vomiting is certainly less common than it is after the use of chloroform alone, and as a general anæsthetic it should be employed.

Extent of the Incision into the Abdominal Parietes.

The temperature of the room, the position of the patient, and the propriety of the administration of chloroform, having received our attention, the operation itself next claims consideration, and the first thought naturally refers to the extent of abdominal incision that is required, for there is still a want of unanimity in the practice of different surgeons upon this point.

Before commencing, however, the careful surgeon will see that the bladder has been emptied by means of a catheter; that the linen of the patient has been well drawn up out of harm's way, and free from the chance of becoming soiled; that the limbs of the patient are well protected and kept warm by a pair of drawers, and covered by a clean sheet, either with or without a blanket. He will see that all his assistants are carefully arranged, with special duties assigned to each, and every instrument that may be required nigh at hand.

The surgeon may then proceed to make his incision, the patient having been brought completely under the influence of chloroform; but, beforehand, he has to determine as to its length. On reference to the results of the practice of different operators, it may with confidence be asserted that it has been fairly decided that it is not of much importance whether the abdominal incision be a long or short one. From Mr. Walne's, Dr. Simpson's, and Dr. Clay's practice, it might be argued that the long incision should always be adopted, for their success has been great, and in their practice the long incision has been invariably employed. From the practice of

Dr. Keith, Mr. Spencer Wells, Mr. Baker Brown, and others, the short incision would appear to be the best, for their success has at least been as good as that of Dr. Clay and others, and as a rule the short incision has been the one selected. But I take it the truth lies between the two extremes.

When the tumour can be removed with facility by means of a short incision, a long one is clearly not required, and when the tumour is monocystic, or nearly so, and free from abdominal adhesions, such a result may be confidently looked for. But when the tumour is large and semi-solid, or when adhesions exist which cannot be readily broken down by the employment of gentle traction upon the growth, it is, doubtless, the best practice to make a long incision, for by so doing the removal of the growth is much facilitated, the causes of its abdominal retention, and the connection of the adhesions, are satisfactorily ascertained, and as a consequence can be dealt with with greater safety.

My own practice has been hitherto influenced by such a conviction; for I have in all cases commenced the operation by making a short abdominal incision, and, in many, have been enabled to remove the tumour without further trouble. But in certain examples in which difficulties appeared, and in which it was clear that adhesions existed—for the breaking down of which some force would have been required, and some working in the dark called for—I have been induced to increase the length of the wound upwards, even for an inch or two beyond the umbilicus, regarding such an increase of the incision as unimportant in comparison with the evil effects of violence, and dragging upon the tumour for the purpose of its removal, or the blind tearing down of the abdominal or visceral adhesions which have detained the growth.

I have never seen any evil effects from the long incision when made under the circumstances I have just indicated, but have, without doubt, seen the bad results of an opposite practice, of the violence which has been employed in an attempt to remove a large growth through a small opening, or to tear an adherent one from its abdominal or visceral connections.

The incision should also always be made sufficiently low; if too high, considerable traction upon the pedicle of the

tumour must be made to bring it into sight, and, with the tumour, the uterus will also be drawn out. This traction is always injurious, and is to be avoided. When the lower end of the wound is too high up, this traction of the parts becomes clearly unavoidable, and it is well, therefore, that it can be avoided ; by extending the incision downwards towards the pubes to a point corresponding to the upper part of the healthy uterus, or about one inch above the pubes, this evil can be prevented, and, consequently, the practice I have just advised should invariably be adopted.

On Adhesions and their treatment.

When the incision through the abdominal walls has been made, and the ovarian cyst is seen to be moveable within the abdomen, and free from parietal adhesions, there is little difficulty in readily making out its visceral peritoneal covering by its smooth glistening surface ; and by a glance of this the surgeon may become perfectly satisfied that the abdominal cavity has been fairly opened and the tumour exposed. It is also pleasing for the surgeon to observe, on the completion of his abdominal incision, that the tumour moves freely within the abdomen on each respiratory act, for when this symptom exists there is a strong probability—if not certainty—that the tumour is free, and that the complication of adhesions is not likely to be severe. When the tumour is fixed to the abdominal walls this mobility of the cyst is not present, and it will be well therefore for us, before we pass on, to consider how these adhesions are to be treated.

They may present themselves to the surgeon on the completion of the abdominal incision in two forms. *Firstly*, as forming a complete and compact union between the peritoneal covering of the cyst and the abdominal peritoneum ; and *secondly*, as loose and fibrous connective bands. These last are easily treated, and for the most part readily broken down, and when due to old tapping operations—a common condition—they may be destroyed by the careful introduction of the finger through the margin of the wound.

When a firm and compact union, however, exists between the cyst and the abdominal peritoneal membrane, the surgeon will have lost his guide as to the depth of his abdominal sec-

tion, and he may experience some difficulty in deciding whether the abdominal cavity has been opened or not.

Under these circumstances he must be careful in his procedure, for he is not far from the possibility of perpetrating a fatal error,—the separation of the parietal peritoneum from its muscular connections. How is this error, therefore, to be avoided? By a simple process—by merely extending the abdominal incision upwards until the distinct line of separation between the cyst wall and the abdominal peritoneal membrane is clearly seen. With this unerring guide before the eyes of the surgeon, the error to which I have alluded can be guarded against, and the next step of the operation safely proceeded with—the breaking down of the adhesions. As a rule, this may readily be done by the careful introduction of the finger between the cyst walls and the peritoneum of the abdomen; some little force is here perfectly justifiable, for if the adhesions are confined to the abdominal parietes, and can be torn through, there is rarely much subsequent danger to be apprehended. Extreme care is, however, required at this stage of the operation. The surgeon should, by the introduction of his finger, fairly make out the extent of the adhesions, and test their strength, for if found to be extensive, and too firm for separation, the operation had better, at this stage, be abandoned, and the wound closed. Should many visceral adhesions of a firm character be also present, it would be well to follow the same practice; for far greater danger lies with the visceral than with the parietal adhesions. It is difficult, if not impossible, to describe with anything like accuracy the extent or character of the adhesions, the presence of which would justify the surgeon in abandoning a case, and closing a wound after its commencement. The careful study of reported cases, and experience alone will enable surgeons to decide with certainty upon these points. Still, as a broad rule, it may be asserted that parietal adhesions may be fearlessly treated when they can be divided, but that visceral and pelvic are always to be regarded with alarm; that the amount of force which may be regarded as permissible in the treatment of the former class of cases would be quite inexcusable when the viscera are concerned; and that moderate force should alone be employed, for all violence is to be condemned.

The fear of hæmorrhage from the lacerated adhesions should always be before the surgeon, and the torn surface should always be carefully examined, with a view to its arrest.

Omental adhesions in particular should be examined with care, and torn through with caution, for these parts are very vascular and cannot be treated with too much consideration ; as a rule, they should be divided and secured with a fine ligature, or perhaps, which is better, by means of the actual cautery ; force in their separation is always bad.

Firm band-like adhesions may be similarly treated. The ends of the ligatures may be cut off and left in. When, however, the incision has been made, and there is no evidence that adhesions exist between the cyst and the internal abdominal walls, it appears to be an unnecessary practice, if not one of considerable danger, for the operator to introduce his hand into the abdominal cavity with the view of learning whether there exist any peritoneal adhesions. If adhesions do exist in front they must necessarily be broken down, but I believe it to be the best practice to separate all others as they manifest their presence during the removal of the tumour, and by following this practice it will sometimes be quite unnecessary for the operator to introduce his hands into the abdominal cavity at all. When adhesions exist they can frequently be broken down by the finger of the operator, introduced at the wound's margin, for as the cyst empties, these adhesions are necessarily brought forward, and when they do *not* exist the peritoneum escapes even the touch of the hands of the operator. In complicated and exceptional examples of this operation, it is clear that this practice cannot be followed, but in the more ordinary and simple cases it is most applicable. In several of the examples which I have recorded, the value of this advice has been well proved, for in them the peritoneum was touched only by the knife and needle.

The Treatment of the Pedicle.

If there be one thing more than another in the practice of Ovariectomy which presses for a solution, it is the treatment of the pedicle, for the practice of different surgeons on this point

varies extremely, and the multiplicity of methods is most confusing. In France, Maisonneuve twists off the cyst by continued torsion, leaving the pedicle to fall back into the abdomen; whilst Nelaton prefers to fix the pedicle externally, and secure it by means of a common clamp.

In Germany, Martin and Langenbeck cut through the peritoneal covering of the pedicle by a circular incision, cut off the tumour, tie each vessel separately, and fix the pedicle to the walls of the abdomen by means of a double ligature.

Dr. C. Clay fastens the pedicle by a double ligature, cuts off the tumour, and, having allowed the pedicle to drop backwards into the pelvis, brings the ends of his ligatures out through the lower end of the incision.

Dr. Tyler Smith fastens the pedicle in the same way as Dr. Clay, but differs in the important respect of dropping both pedicle and ligatures, which are cut off close, into the pelvis, and closes the wound.

Mr. S. Wells prefers to fix the pedicle externally, by means of a clamp; and recently Mr. B. Brown has divided it by the actual cautery, and allowed it to drop back into the pelvis. Atlee, of America, employs the *ecraseur*. In my own practice, I have adopted no one single method, having been influenced in my decision by the special peculiarities of the case. This point will receive attention as we proceed.

If we refer to the results of the practice of different operators, who have been in the habit of adopting the various plans to which I have alluded, it will be seen that good success has attended each; that the success which has followed the application of a double ligature to the pedicle, its subsequent retraction, and the bringing out of the ends of the ligatures at the lower margin of the wound, is about as great as that which has followed the withdrawal of the pedicle from the abdominal cavity, and its fixture externally. But the results which attend the dropping of the pedicle into the pelvis, after its ligation, or division by the ligature or cautery, and the subsequent closure of the wound, appear to be the best. In my own practice, out of ten cases I have lost but two, and in one of these both ovaries were removed. More extensive experience is, however, required to settle this point.

The first object the surgeon has in view in the treatment of the pedicle is to prevent hæmorrhage, and in the attainment of this end, to employ such means as are the least liable to excite, or be followed by peritoneal inflammation.

When experience has decided upon a plan which will with certainty secure these two objects the surgeon has in view, the one great problem which attends the practice of Ovariectomy will have been solved, and the mortality of the operation will, doubtless, be much diminished.

In the infancy of Ovariectomy the early operators treated the pedicle upon the simplest principles; they secured it by one or two ligatures and brought the ends of the ligatures out of the wound; but subsequent experience has taught us that the fastening of the pedicle by one ligature is a dangerous practice, and cannot be adopted with safety; it does not attain even the first object the surgeon has in view, namely, the security from hæmorrhage; the mortality of the cases in which it has been employed having been very great. In the following figures of Dr. Tyler Smith this fact is fairly shown, for out of 179 cases in which the pedicle was ligatured in two or more parts, 122 recovered, and 57 died, or 31·8 per cent. In 48 cases in which the pedicle was ligatured singly 22 recovered and 26 died, or 54 per cent.; the mortality of the cases in which the single ligature was employed being as 54 per cent. to 31.

The practice of fastening the pedicle by a double ligature, and of bringing the ends out of the wound, however, still exists, and in Dr. Clay's hands has proved successful.

The fear of exciting peritonitis by the presence of such a foreign body as a double ligature hanging from the wound, and the natural dread that surgeons entertained of evil consequences from the decomposition of the extremity of the ligatured pedicle within the pelvis, rendered the minds of surgeons dissatisfied with the practice just described, and, amongst many suggestions, induced Mr. Duffin to urge the expediency of keeping the strangulated stump of the pedicle outside the wound, and Mr. Hutchinson to perfect the practice by the introduction of the clamp. Up to a recent date this practice has been generally approved, and as can be seen by the statistics of the different

operators, it has hitherto borne good fruits; still, to the minds of reflective men, the practice was not so satisfactory as could be wished; the good which was evidently acquired by the maintenance of the secured pedicle external to the wound being neutralized in certain cases by an undoubted evil. When the pedicle was long and narrow, the practice appeared to be good and successful; but when the pedicle was short or broad, many bad effects became perceptible—evils which could only be attributed to the traction upon the uterus and its appendages from their pelvic position. It was thus, therefore, that other plans of treatment were looked for, by which this traction on the pedicle could be obviated, and yet security from hæmorrhage be guaranteed.

The plan of treatment which naturally suggested itself was the dropping in of the pedicle with the divided ligature, and this was first done in 1829 by David Rodgers, of New York, who, in removing an ovarian tumour, applied a ligature to the pedicle, cut short both extremities of the ligatures, returned the pedicle into the abdomen, and closed the external wound. His patient made a good recovery.

This plan of treatment, however, did not meet with general approval; it was too bold, and was inconsistent with all past experience and professional prejudices;—it fell to the ground. It is true that it was at intervals repeated by other surgeons with tolerable success, but it is certainly due to the courage of Dr. Tyler Smith, that it has now gained a hold on the professional mind, and bids fair to become a more general practice.

I may here mention that Sir B. Brodie had some confidence in this practice, for in 1843, when discussing the case upon which Mr. Aston Key had operated at Guy's Hospital, without success, he expressed his belief that the right treatment of the pedicle was to drop it in and close the wound, and that if success was to be secured, it was by such means. I make this statement on the authority of Dr. Oldham, who heard the remark.

In a fatal case recorded by Dr. Peaslee, in the *American Journal of Medical Science*, July, 1865, in which this practice was adopted and death followed the operation on the

17th day, the extremity of the pedicle was found to be atrophied, but not sloughing, and the ligature was covered with an exudation of lymph, which had already become somewhat organized.

In our profession, however, a theory, when once established rapidly develops, and a practice which is based on a received principle soon improves. The professional mind having realized the fact that the pedicle of an ovarian tumour may be with safety strangled by a ligature, dropped into the abdomen, and the wound closed; and having been taught by the results of experience that the strangled extremity of the pedicle did neither decompose nor set up any peritoneal mischief—looked out for some other plan of treatment, by which the presence of the foreign body—the ligature—might be done away with, and as a result, the division of the pedicle by the actual cautery has been introduced; the treatment by the *ecraseur* not meeting with support. It is a bold practice, and has the advantage of past experience in its favour, for from the earliest times the hot iron has been a favourite means of arresting hæmorrhage, even from large vessels. In the veterinary art it is also still constantly employed. Mr. Baker Brown, to whom the credit of its application is unquestionably due, tells us that his experience of this form of practice is very good.

In a recent discussion at the Medico-Chirurgical Society, November 13, 1866, he informed us that out of 41 cases of Ovariectomy he had thus treated, 36 recovered, and 5 died; and what is of great importance, that in all those 5 cases he had been subsequently obliged to apply a ligature to the vessels on account of the failure of the cautery. Mr. Harper stated that he had used the cautery in 8 cases, and that in two of them hæmorrhage followed, but those two cases did well. Mr. Wells had also found in his cases that hæmorrhage followed the use of the cautery in the same proportion as had taken place in Mr. Harper's practice.

Upon the whole, the evidence seemed to show that the practice is a good one in certain cases—that is where the vessels are of small size, but that where they are large, it is not trustworthy; that in short, fleshy, and broad pedicles,

the cautery is efficient, but that in the long and thin pedicles it is not reliable—and it is in these cases, happily, that other treatment is most successful.

More facts are, however, required, bearing upon these points, before the practice can be generally received. Still, the practice may be improved, and by means of the cautery, aided by the crushing of the pedicle's extremity, safety may be found, even in extreme cases.

What, then, it may be asked, is the right treatment of the pedicle of an ovarian tumour? Is it always to be secured by one method?—and if not, under what circumstances is the plan to vary?

The object the surgeon has in view is to control and prevent hæmorrhage, and to do this in a way that is the least likely to excite any undue peritoneal inflammation, and with the attainment of this end it is tolerably clear that the less there is left of a foreign body within the abdomen, the better must be the practice. Going back to past experience, we have learnt that if the pedicle is to be tied, it must be tied in at least two places; and that all traction upon the pedicle, and, as a consequence upon the uterus, is to be regarded with apprehension and should be, therefore, avoided.

We have learnt that the pedicle may be ligatured in two or more parts, dropped back into the pelvis, and that the ends of the ligatures may be left hanging from the wound with a good result; and that the pedicle may also be fastened externally by means of a clamp with equal success. But we have also learnt that at least as good success, and perhaps better, is gained by dropping the pedicle into the abdomen, after its division by the crushing clamp and cautery, or after it has been ligatured in two or more portions, and the ends of the ligatures have been cut off.

The right practice doubtless consists in the latter forms of treatment, for it having been fairly established that no bad result follows the dropping in of the divided pedicle, and that the presence of its crushed, strangled, or cauterized extremity, when secluded from the air and confined within the abdomen, is free from danger, it remains only for us to consider, and for experience to point out, the several conditions under which these plans of treatment are to be attempted.

We are ready to accept the principle that the right treatment of the pedicle lies in its division, its being dropped back into the abdomen, and the subsequent closure of the wound ; but it is yet to be determined under what circumstances the pedicle is to be divided and ligatured, and under what conditions it is to be divided by the cautery with safety.

It would appear, however, as far as present experience has gone, that in short and broad pedicles in which the vessels are usually small, the cautery may be employed, but that in small and long pedicles in which the vessels are usually large, it is not to be tried, and that in these the best practice consists in ligaturing the pedicle in two parts, cutting off the ends of the ligatures, dropping the whole in, and closing the wound.

Should subsequent experience prove that the cautery is to be relied on in the cases I have just mentioned, whether aided or not by other means, we shall doubtless have discovered a plan of treatment which bids fair to do more for Ovariectomy than any other improvement of modern times. For hitherto it has been in the treatment of these short and broad pedicles that Ovariectomists have experienced so much difficulty ; but judging from past experience, the practice can hardly be said to have yet arrived at this state of certainty. In the majority of cases the pedicle may doubtless be divided by means of the cautery, and of the moderate amount of crushing which has been hitherto employed, with tolerable safety ; but when vessels are found to exist as large perhaps as the brachial artery, it has been regarded as the safest plan to tie them separately, the remainder of the pedicle being treated by the hot iron ; but in these doubtful cases the soundest practice probably is to ligature the pedicle, for the presence of a ligature does away with the simplicity of the method, which is the chief charm in the actual cautery ; and if a cord is to be applied, it is probably the safest practice to apply it around the pedicle and thus guarantee success, than run the risk of internal hæmorrhage. It is true that other means of arresting hæmorrhage, even through large vessels, may yet be found in which no ligature is required, and of these it appears highly probable that the combination of the crushing and cauterizing methods will be the best. When this end has been secured we shall have made a real advance. Already the minds of

different men have been directed to the attainment of this end, and Mr. Chambers, and my colleague Dr. Braxton Hicks, have already invented instruments for the perfection of this principle of practice ; but experience has yet to prove that these ends are to be secured by their employment ; in theory they promise much, but they have not yet passed through the ordeal by fire, and true faith in them is not yet established.

In the treatment of adhesions, our practice is to be governed by like principles. When they are slight they may be broken down ; when strong they may be divided or ligatured, or perhaps destroyed by the cauterly. When large vessels exist they must be tied until the crushing and cauterizing plan of treatment has been perfected. But at present let no risk be run, let the ligatures be applied, and their ends cut off, rather than incur any chance of bleeding.

On Sponging out the Pelvis.

The operation of removal of the tumour having been completed, and the pedicle secured, it will be well for the surgeon to examine the opposite ovary, to be sure of its healthiness, and then to turn his attention to the presence of the fluid or blood that may have escaped into the pelvis during the progress of the operation. Should the fluid of the ovarian cyst have been of the serous kind, and the evidence of the extravasation of blood into the abdomen be purely negative, there will be little or no need of running the risk of irritating the peritoneum or pelvic organs by the application of a sponge, for the thin serous fluid of ovarian cysts is readily absorbed, and the presence of a little blood is of small consequence ; for we know from experience that blood may be extensively effused into a joint, and no evil follow, as it may into the cellular tissues of a part, and yet be absorbed. Obstetricians will also readily recall cases in which blood has been effused into the peritoneal cavity, without, of necessity, any serious result. A sponge should not, therefore, be applied to the delicate surface of the peritoneum without good reason, and where the fluid of the ovarian cyst has been simply serous, and there is no evidence of the effusion of blood in any quantity, there is no need of its

use. When required, it should be a new one, of the softest kind, and well warmed; two or more dips into the pelvis being carefully made, to free it from all foreign matter. The sponge appears to me to be far preferable to any flannel, for, when properly cleansed and soft, it is most unirritating, and not so likely as flannel to leave behind it any foreign matter.

The sponge should always be carefully employed when there has been any escape of mucous or other thick ovarian fluid, and when much blood has been effused; indeed, in some cases, much care is required to cleanse the pelvis from all such irritating materials.

Treatment of the Wound.

The operation having been completed, the pedicle ligatured, and the pelvis cleansed, the opposite ovary having been also examined the surgeon should satisfy himself by a careful examination, that all signs of hæmorrhage are absent, and that all is safe within, and he may then proceed to the closure of the wound. He should do this by means of deep and superficial sutures. He may use silk or silver sutures, according to fancy; in my early operations I chose the silver, but I have now discarded them, as I do not find them less irritating than the silk, and in their removal, they are more prone to scratch and tear the tissues through which they are drawn, than the fine silk plait I am in the habit of employing. The fine white plait, sold by fishing-tackle makers, is by far the best.

It is not yet decided by operators whether the peritoneum should be included in the sutures or not. The fact that different operators adopt different plans with equal success, tends to prove that the point is not of much importance. In my own operations I have, as a rule, included the peritoneum; in exceptional cases I have failed to do so, and upon the whole I do not think the matter is of much consequence. The sutures should, without doubt, include the muscles. They should be inserted at the distance of one inch, and be well secured; other intermediate superficial sutures should be inserted through the skin. When union has taken place, the sutures should be removed—any time between three and six days will, as a rule, suffice; but when repair has taken place,

there is no object to be gained by leaving them *in situ*. They are then foreign bodies, and should be removed.

The After Treatment.

Whenever a patient has taken chloroform or any anæsthetic mixture, it is always a good practice to keep the stomach as quiet as possible, and as the benefit of an opiate after the operation is always great, it is the best plan to administer one by the rectum; in abdominal operations this practice is one of great value, and for some years I have been accustomed to give a ten grain suppository of the compound soap pill after every ovarian operation, as well as after others of hernia, ruptured perinæum, &c. The suppository should be administered before the patient has recovered from the effects of the anæsthetic, and care should be taken that it be well passed up the rectum. Should pain appear, the suppository may be repeated, but it is rarely necessary to administer it more than once a day—at bed time. The patient's room should be kept cool and airy, as in other cases of operation. For the first few days, beef-tea, milk, and arrowroot are generally the chief diet; but should sickness be present as a result of chloroform, ice and milk, or ice and soda water should be administered; everything should, at any rate, be cold. Should sickness still continue, food should be given two or three times a day, by the rectum. As soon as the stomach will admit, fresh meat, brandy, and wine should be carefully given, the object being in these cases, as in all others of general surgery, to keep up the powers of the patient, and so enable nature to complete the cure. One thing, however, is of essential importance in these cases, and that is to prevent the patient straining her abdominal muscles in the slightest degree. The urine should, therefore, be drawn off periodically by the catheter, and when the bowels require relief, their action should be rendered easy by the use of enemata. The bladder should never be allowed to become distended, nor should the bowels be left loaded too long. When the inclination is strong, to give relief, an enema should be administered, care being observed in its employment.

On the use of opium a few remarks remain to be made, for

upon this point the practice of surgeons appears to be undergoing a change. In the early operations of Ovariectomy it was extensively employed, and at the present time some surgeons are still free with its use, but there is good reason to believe that in this operation, as in others, a too free administration of this drug in every case, is not attended by such good results as could be wished; and that, in a patient under its full influence, a wound does not repair so rapidly and favourably as another in whom natural processes are allowed to progress without interference. Opium, carefully given to allay pain and cause sleep, is a drug upon the value of which there is no room for doubt. But opium administered with sufficient freedom to bring, and repeated often enough to maintain, a patient under its influence, is a drug upon the use of which a surgeon should be on his guard.

In ovarian cases it should not be given in larger quantities than are found sufficient to allay pain and secure sleep. A patient should not be kept under its full influence, except under exceptional conditions, for wounds do not unite so well with a patient fully under the effects of this drug as under other circumstances. It is best administered, also, by the bowels. It is less liable to cause its injurious effects, and is more liable to produce its good. It is absorbed, at least, as rapidly by the rectum as by the stomach, and, in abdominal operations, it tends much to maintain that requisite quiescence of the bowels' action, which in all such cases is so desirable. In my own practice I have been accustomed for some years to administer opium by the bowels in preference to the stomach in all cases of abdominal surgery.

CASES.

CASE 1.—*Multilocular ovarian tumour; Ovariectomy; peduncle fixed outside; fatal result on fourth day.*—Mary C—, a married woman, æt. 30, was admitted into Guy's Hospital in the autumn of 1860, with an ovarian tumour of two years' growth. She was a cachectic looking woman, although she had always enjoyed good health up to the time of the first appearance of the present malady. She had been married eight years, but never been pregnant. The disease was detected accidentally two years before her admission, the tumour apparently growing from the right side; its growth had been tolerably gradual on the whole, although, for the last eight months, it had been more rapid. When first admitted into Guy's Hospital, under the care of Dr. Braxton Hicks, a very solid multilocular ovarian tumour was readily diagnosed; but, as it then caused her little inconvenience, and was not very large, all operative interference was rightly postponed. She consequently left the hospital, but in three months was again admitted, the tumour having in this interval rapidly increased, and extended high up into the left side; the abdomen was tense and fluctuating, the solid mass of tumour being apparently pushed high up from the rapid development of some large parent cyst.

Under these circumstances it was tolerably certain that life could not long be sustained by any temporising treatment, and, with the view of a capital operation, Mr. Thomas Bryant was consulted.

It should be added that a careful vaginal examination afforded no contra-indication to such a practice.

The desirability of an attempt at the removal having been decided on by Dr. Hicks and Mr. Bryant, Dr. Oldham also

concurring in the opinion, the advantages and risks of the operation were then fairly laid before the patient, and, without any hesitation, her consent was procured. She was therefore removed to a private ward, and isolated, as far as possible, from all injurious influences, and on December 5th, 1860, the operation was performed. The patient having been brought under the full influence of chloroform, was placed in a recumbent posture, with the shoulders well raised. Mr. Bryant then made his incision, commencing one inch below the umbilicus, down to the pubes, about seven inches in length. Having exposed the tumour, the lower cyst was tapped, and through this many secondary cysts were also opened. The tumour, being thus readily lessened in size, easily escaped from the abdominal cavity, the hands of an assistant carefully following up the tumour, and preventing the escape of the intestines; a broad pedicle was then found to exist, which was temporarily compressed by the ordinary clamp, after which a double ligature was passed through the pedicle, beneath the clamp, and the whole tied in two portions. A few vessels had to be tied at the point at which the pedicle had been transfixed. The wound was subsequently closed by three long harelip pins, two being passed above and one below the pedicle, which it transfixed, and the woman placed in bed. Opium was freely given, with apparently a good effect, for forty-five hours, when vomiting and tympanitis appeared. The pulse became small, quick, and thready, and the skin bathed in perspiration; rapid exhaustion followed, and death took place about seventy-eight hours after the operation. After death a low kind of peritonitis was found to exist, but nothing else to account for the fatal result.

CASE 2.—*Unilocular ovarian tumour, of two and a half years' duration; Ovariectomy; peduncle secured by clamp; recovery.*—(Reported by Mr. Cleveland Smith.)—Ellen D—, æt. 32, was admitted into Mary Ward, on July 30th, 1862, under the care of Dr. Oldham and Mr. Bryant. She was a resident of Hull, married, had had three children, the youngest being three years old, and had always enjoyed good health.

Two and a half years before admission she observed that her abdomen was larger than natural on the right side, but this swelling was unattended by any other symptom of disease, and the catamenia continued regular till November, 1861, but since that date they ceased.

On admission the abdomen was enormously distended, apparently from a single cyst. All the viscera appeared to be sound.

On August 1st paracentesis abdominis was performed, and ninety pints of a dark fluid drawn off. Immediate relief followed the operation, from which she soon rallied, and left the hospital on the 15th of the same month.

During her stay, however, the subject of the removal of the tumour had been laid before her, and, as the fluid began rapidly to re-collect, she readily assented to the performance of an operation, and for this purpose was re-admitted on the 29th of September. At this period, hardly two months after the date of her first tapping, her abdomen was as large as ever; no tenderness was to be observed; her general health was good, and she had fully made up her mind to submit to the operation. Both Dr. Oldham and Mr. Bryant believed the case to be a good one for such an attempt, and fully explained to the patient the chances of success on the one hand, and the certainty of an early death on the other if temporising measures were alone adopted, and she wisely consented to the means which were carried out.

She was accordingly removed to a private room over the clinical ward, and placed in charge of an experienced nurse. All admission to any person or student who was not absolutely required for her care and treatment was strictly prohibited, as it was Mr. Bryant's wish that every influence should be excluded which might possibly prove injurious, and he was therefore anxious to place her as much as circumstances would allow in the position of a private patient.

On October 15th, at 2 p.m., the operation was performed by Mr. Bryant, assisted by Drs. Oldham and Hicks, and Mr. Cooper Forster. The house-surgeon, two dressers and ward clerks, and two visitors, were also present. Chloroform was given, and the patient was placed on a table in a semi-recumbent position, the legs being supported on a chair.

An incision about eight inches long was made beneath the umbilicus down to the cyst-wall, and a trocar and canula introduced. It was then discovered that the cyst-wall was firmly adherent to the abdominal wall, and some care was required in separating the two. This was done by Mr. Bryant introducing his hand carefully over the cyst-wall, and tearing the adhesions away, having previously with a pair of claw forceps laid hold of the cyst-wall, steady traction being made upon it for its removal with the right hand whilst the adhesions were broken down with the left. A large piece of omentum, which was torn off the cyst wall, had to be tied on account of the fear of hæmorrhage, and this was left in the wound. The cyst then turned out very readily, and the pedicle, which was narrow, was secured by an ordinary clamp. The tumour was then excised. It was needful to apply one ligature to a small bleeding point, as well as to sponge away the blood which appeared on the surface of the intestines at the wound's margin, but it was not deemed advisable to sponge out the pelvis, or to manipulate the intestines more than was absolutely necessary. The peritoneal wall, which had been adherent to the cyst, was very vascular, and from this it was feared that some hæmorrhage might subsequently take place. The edges of the wound and the peritoneum were then brought together by wire sutures, and the clamp secured, a piece of lint only being gently laid over the wound. It so happened that the pedicle was tolerably long, and that therefore there was but little traction made upon the pelvic organs. During the operation there was some sickness from the chloroform, and subsequent collapse, but this rapidly disappeared.

The woman was then removed to bed, when she recovered quickly from the influence of chloroform. At 5 p.m. her skin was cool and moist, pulse 88. 10 p.m.—Pulse 100, skin bathed in a clammy sweat; she was very restless; some vomiting had also occurred. Soda water and brandy were given, with ice to suck.

October 16th, 3 a.m.—Vomiting has quite ceased. Pulse 105, and bounding; she was restless, and felt disposed to sleep, but could not; fifteen minims of the tincture of opium were given, and she slept for two hours.

17th, 10 a.m.—Passed a good night; pulse 100; skin cool and moist; has passed a good deal of wind; the clamp was now removed, forty-eight hours having expired since the operation, a portion of sloughing omentum removed, and a vessel which burst out bleeding from the stump tied; the edges of the wound had united. Wine z iv ordered.

18th.—Slough separating from pedicle; in all respects she is doing well; has taken plenty of liquid nourishment with appetite.

20th.—Passed a somewhat restless night; bowels freely relieved, a warm-water enema being given to assist their action. Wine z vj, and chicken for dinner.

24th.—Four of the sutures were removed; wound has nearly healed.

25th.—The remaining sutures were taken away; the mass of omentum which was left external to the wound is rapidly contracting and wasting away.

27th.—Has had her bed changed to-day, and sat up in it without inconvenience.

November 1st.—Was able to walk about, and on the 15th, only one month after the operation, she left the hospital, convalescent.

This patient has since been heard of, and was safely confined of a healthy female child about November 25th, 1863, having, however, endured considerable pain from urinary irritation for some months previously.

CASE 3.—*Unilocular ovarian tumour; Ovariectomy; clamp; recovery.*—(Reported by G. P. Wilks, M.B., M.S. Cantab).—Ann G—, æt. 25, a single woman, a resident of Swansea, was admitted into Guy's Hospital, in February, 1863, under the care of Dr. Oldham and Mr. Bryant, with an ovarian tumour, which was apparently growing from the left side.

She first menstruated at the age of nineteen, but the catamenia were always irregular.

The tumour was first observed four years ago, in the left side, and was the cause of some pain. It enlarged gradually until November last, when she was admitted into the Swansea Infirmary, and was there tapped, ten quarts of fluid being drawn off. She was much relieved by this operation

for a time, but the cyst gradually refilled, and when admitted into Guy's, scarcely two months after the tapping, the tumour was as large as ever. On admission she was apparently in good health; having a fresh colour, and all the external appearances of a healthy woman. It was elicited, however, that she had been the subject of several attacks of bronchitis, one or two having been very severe. The abdomen was large and flaccid, measuring thirty-six inches in circumference. Fluctuation was very distinct, and the tumour was composed apparently of one cyst. The vagina and uterus appeared to be healthy, and were quite free from all abnormal attachments. On the whole, the case promised well for operation.

On March 20th Mr. Bryant performed the operation of Ovariectomy, in the presence of Drs. Oldham and Braxton Hicks, who, with Mr. Cooper Forster, kindly assisted. The operation was undertaken in a private room, and only such students were admitted as were required to assist, or who were acting as dressers and clerks to the case. It was a very simple one. An incision five inches long was made, the cyst tapped, and the tumour readily removed from the abdominal cavity. A piece of omentum, which was firmly adherent, was ligatured in two places and divided, the pedicle, which was small, being fixed by means of the clamp. The edges of the wound were then brought together with wire sutures, the peritoneum being included, and water dressing applied.

Some slight vomiting followed the operation, most probably due to the chloroform, and in the evening she began to cough. Ice and milk were ordered, with effervescing mixture.

March 21st.—Had a quiet night. Pulse 100. Is in no pain. Cough, however, somewhat troublesome, attended with a mucous expectoration.

22nd.—Slept at intervals during the night, but was disturbed by her cough. No abdominal pain nor distension. Wounds looks healthy. Beef tea, bread and milk, ordered.

24th.—As far as the operation goes, nothing could look better. Her bronchitis is still, however, about the same. Fish and eggs ordered.

25th.—The clamp and three of the sutures were removed to-day. Wound nearly closed.

26th.—Going on well. Mutton chop.

28th.—Catamenia appeared this morning, but without giving rise to any disturbance. Appetite good; bowels relieved; cough somewhat better.

The wound has quite healed, with the exception of the small piece of omentum which was left outside. By April 10th, however, this had contracted, and, as far as the operation was concerned, she was pronounced cured.

Her cough was, however, very troublesome, and she was transferred into a medical ward under the care of Dr. Gull. Her chest symptoms varied from day to day, expectoration being at times very profuse and fetid. Gangrenous pneumonia at last set in, and carried her off on May 21st.

CASE 4.—*Semi-solid ovarian tumour; Ovariectomy; Peduncle ligatured; death in thirty-seven hours.*—Julia P—, a married woman, æt. 44, was admitted into Guy's Hospital, on July 1st, 1863, under the care of Dr. Braxton Hicks and Mr. Bryant. She had been the subject of the disease for some years, and its increase had been somewhat gradual. She had been tapped once, but only a little thick tenacious fluid was drawn off. The case was by no means a favourable one for operation, as the patient's health had materially suffered, yet there were no pelvic conditions which militated against the attempt.

On July 25th the operation was performed in a private room by Mr. Bryant, with the assistance of Drs. Oldham and Hicks. The small incision was made, and the pedicle, which was a broad one, secured with thin whipcord ligatures. The tumour, when removed, was found to be of the colloid nature; there were no adhesions. Symptoms of peritonitis speedily set in, and death followed in thirty-seven hours.

After death the usual appearances of peritonitis were visible, but nothing else worthy of record. The viscera were healthy.

CASE 5.—*Multilocular ovarian tumour; Ovariectomy; Peduncle ligatured; recovery.*—(Reported by Mr. Chauncey Puzey.)—Lucy W—, æt. 17, residing at North Brixton, was sent to Mr. Bryant by Mr. T. O. Duke, of

Kennington, under whose care she had been for ovarian dropsy, with the view of some capital operation being performed. She was a remarkably healthy looking girl, the member of a healthy family, and had enjoyed good health until one year previously, when she began to feel pain in her right side, which was aggravated by exercise. A swelling at the part soon made its appearance, which gradually increased, and when coming under observation her abdomen was as large as that of a woman nine months gone in pregnancy. The catamenia had appeared at the age of thirteen, and had been quite regular ever since. Her general health was also good. Some swelling of the legs had, however, existed towards night for the last few months.

The girl was admitted into Guy's Hospital, into Mary Ward, on July 18th, 1863, under the care of Dr. Oldham and Mr. Bryant, when a careful examination of the tumour was made. The abdomen was tense and fully distended, measuring thirty-six inches in circumference. The ovarian tumour was apparently polycystic and somewhat solid, fluctuation not being very distinct. A pelvic examination also revealed a complete mobility of the uterus. Under these circumstances the question of operation was discussed, and, all things being apparently favourable for extirpation, the risks of the case were fairly laid before the patient and her friends, who readily assented to its removal.

On September 8th, at 1.30 p.m., the girl having been moved into a private room, the operation was performed, a few visitors only being admitted, Drs. Oldham and Hicks, with Mr. Cooper Forster, kindly assisting. The patient being under the influence of chloroform, Mr. Bryant commenced the operation by making an incision from the umbilicus downwards to the pubes, of about six inches in length, and on opening the peritoneum some ascitic fluid escaped. The tumour was then tapped, and some thick, gelatinous fluid drawn off; but as the size of the tumour was but little diminished by this step, two or three other cysts were subsequently opened, the contents of which were, however, more limpid. The cyst-wall during this time was firmly held by means of a pair of vulsellum forceps, by which steady traction was applied, the hands of an assistant, placed over

the abdominal walls, following up the tumour as it escaped from the abdomen. The cyst readily turned out, no single adhesion being present. The intestines were also well secured from view.

The pedicle was found to be a broad one, and at its base a mass of enlarged veins was visible. To this three whipcord ligatures were applied, but, it should be noted, to the distal side of the large veins, which were consequently left untouched, and the tumour was excised; the wound was then brought together by means of four deep wire sutures, which were passed through the peritoneum, and one through the pedicle which was thus kept outside the abdomen; the introduction of several superficial sutures finishing the operation. Ten grains of the compound soap pill were then introduced as a suppository, and the patient placed in bed.

It should be remarked that the hand of the operator in this case scarcely touched the peritoneum, all exploratory examinations for adhesions having been dispensed with.

The tumour, when removed, weighed sixteen pounds, and, as already stated, was polycystic.

10 p.m.—The patient vomited, for the first time since the operation; a second suppository was given to relieve the pain, which existed, and with benefit. Pulse 112. Ice ordered to suck.

9th, 9 a.m.—Vomiting still continues, but between the attacks the patient dozes. Abdomen flat and flaccid, but tender. Pulse 120. Skin hot. 2 p.m.—No vomiting since the last report; otherwise the same. Suppository to be repeated at night. 7 p.m.—The patient is still under the influence of opium, and has had a good sleep; in every respect is most comfortable.

10th, 9 a.m.—Has passed a good night and is free from pain; abdomen in the same condition. Pulse 110, of good power. 2 p.m.—Has taken some arrowroot with relish. The suppository to be repeated at night as usual.

11th.—Going on well; free from all pain.

12th.—Upper two thirds of the wound have apparently united. Pedicle sloughing. Beef tea ordered.

14th.—The three superficial sutures removed.

16th.—Two deep sutures at the upper part of the wound removed. Bowels still quiet. Fish for dinner.

19th.—The last suture removed. Ordered mutton chop and wine 3vj.

20th.—Still doing well. Enema of warm water ordered, to relieve the bowels.

23rd.—Bowels freely opened, without pain. Wound closing rapidly. Powers good.

27th.—The ligatures have all come away. Wound closing rapidly.

October 10th.—The patient is up and about. Wound nearly healed.

November 5th.—Convalescent; to leave the hospital. Catamenia appeared before she left.

CASE 6.—*Multilocular ovarian tumour; Ovariectomy; Peduncle ligatured; and fatal result.*—(From notes by Mr. Puzey).—Hannah D—, a married woman, æt. 24, was brought to Mr. Bryant by an old pupil, in August, 1863, with an ovarian dropsy of three years' standing. The tumour had been of slow growth in its early stage, but for some months its increase had been very rapid. In February, 1863, she was tapped for the first time, a second time in May, and again in August, about fifteen quarts of a light-coloured fluid being drawn off at each operation. For the last operation she was admitted into Guy's Hospital, under the care of Dr. Hicks. At this time a very careful vaginal examination was made, and although it was evident that some growth existed in the pelvis, there was nothing which positively forbade the idea of the operation of Ovariectomy. At this time, however, the patient's friends refused their assent to such a step, and she accordingly left the hospital. In October she was readmitted, with her abdomen larger than ever; she was suffering also much pain, and was most anxious to have the tumour removed. A consultation was then held by Drs. Oldham, Hicks, and Mr. Bryant, when it was decided to be but right to give the woman the chance, for it was certain that her life could last only a few months if palliative treatment were alone employed, and there were no very positive indications against the operation.

The patient was consequently moved into a private ward, and on October 8th the operation was performed, the woman

being under the influence of chloroform; only a few lookers-on were admitted, together with the necessary assistants.

Mr. Bryant commenced by making an incision an inch below the umbilicus, and, having divided the peritoneum, an extensive layer of false membrane appeared, completely covering the cyst; it was very thin, like the pia mater membrane, and contained large vessels; it was readily torn through, and the cyst exposed. The tumour was then tapped, and steady traction applied to the cyst-wall, precautions being taken to follow up the escape of the tumour from the abdominal cavity by the hands of an assistant placed over the abdominal walls. The cyst was multilocular, and in some parts solid, being fixed to the pelvis by an enormous pedicle, the upper part of the uterus and the whole broad ligament being involved. The pedicle was tied by *seven* thick whipcord ligatures, and the tumour excised. A second tumour was also found in the right broad ligament, firmly connected with the uterus, about the size of an orange; this, however, was left untouched. The wound was brought together by means of three deep and three superficial wire sutures, and the patient placed in bed. An opium suppository was then administered. The patient quickly rallied after the operation, but at 7 p.m. she complained of much pain and thirst; and was troubled also with great flatulence. 10 p.m.—The patient was suddenly seized with faintness; hands and face became cold and pallid; pulse 120, feeble. There was no oozing, however, from the wound. Dr. Hicks saw her, and ordered a small dose of brandy to be given. 12 p.m.—The symptoms are much the same; there is now considerable jactitation of the limbs, and the patient complains of dimness of sight. The stomach rejects everything, even ice. From this hour she rapidly sank, dying twenty-three hours after the operation.

After death the wound was opened, and about one pint of blood was found in the pelvis. The ligatures on the pedicle were quite firm, and it was probable that the hæmorrhage had therefore come from one of the vessels in the false membrane which covered the cyst. Evidence of acute peritonitis also existed. It was then seen that the tumour in the right broad ligament could not have been removed without the uterus.

CASE 7.—*Multilocular ovarian tumour ; Ovariectomy ; Peduncle ligatured ; recovery.*—(Reported by Mr. BUTCHER.)—H. B—, æt. 34, was admitted into Guy's Hospital, on September 23rd, 1863, under the care of Dr. Oldham and Mr. Bryant, having been sent up from Dartford, in Kent, by Dr. Martin, her medical attendant.

She was a married woman, but had not had any children, although she had been the subject of three miscarriages. Her general health had been tolerably good, but her aspect was not that of a healthy woman. The catamenia had been most irregular.

She had been the subject of ovarian disease for one year, having accidentally discovered about that time a swelling in her right side causing a good deal of pain. The tumour gradually grew, till in June last she measured twenty-nine inches round the abdomen; the cyst was also very tense. She was then tapped by Dr. Martin, who drew off six quarts of a dark-coloured and thick fluid. This, however, rapidly re-collected, and on her admission she was as large as ever.

A careful examination of the abdomen revealed a multilocular ovarian tumour, with apparently much solid matter. It was very tense, and the cause of much pain. A vaginal examination also proved that the uterus was quite free.

The advantages and risks of the operation of Ovariectomy having been laid before the patient, her assent was gained for its performance, and on October 8th, 1863, it was carried out. She was removed into a private room, and, as in Mr. Bryant's other cases, but few visitors were admitted, care being taken that all who were present were free from any morbid influence. Chloroform was given, and an incision, about six inches in length, made from the umbilicus downwards. On opening the abdomen some ascitic fluid escaped ; the cyst was then tapped, and some few adhesions which existed in front were easily broken down ; a second cyst also required to be opened, to lessen the tumour's size ; with a good pair of claw-forceps the tumour was seized, and steady traction made upon it, when it readily escaped from the abdominal cavity, Dr. Hicks carefully following up the evulsion of the cyst with his hands placed over the abdomen. Some of the intestines, however, protruded, but they were at once returned.

The pedicle was a broad one, requiring three good whipcord ligatures to secure it, and when this was done, the tumour was excised. The edges of the wound were then brought together with wire sutures, the peritoneum being included, and the woman was placed in bed, ten grains of the compound soap pill being passed as a suppository.

The patient dozed comfortably after the operation, and at 6 p.m., four hours after, she was quite comfortable, and free from pain. At 10 p.m., she was still dozing. Abdomen flaccid; pulse 90.

9th.—Is as comfortable as possible. Abdomen flat and soft; free from all pain. Pulse 96; tongue natural; skin moist; expression cheerful. Has taken some arrowroot with appetite. Repeat the suppository.

10th.—Has had two hours' sleep; doing as well as possible; wound healthy.

11th.—Is most comfortable; nothing to note.

12th.—Several of the superficial sutures were removed, the wound having united. Towards evening a little flatulence appeared, which was relieved by a dose of bicarbonate of potash.

14th.—Going on most favorably. Ordered chicken for dinner, and wine § iv .

15th.—Has passed some flatus downwards with great relief.

16th.—Wound granulating rapidly; wine § vj .

19th.—Bowels freely opened naturally, and without pain; doing well.

21st.—All the deep sutures removed; wound perfectly united, except over pedicle.

November 3rd.—The wound is nearly well; the granulating stump of the pedicle alone remaining. The catamenia have appeared to-day without pain.

8th.—May be considered convalescent, although the pedicle has not quite healed over.

CASE 8.—*Multilocular ovarian tumour; Ovariectomy; Clamp to Peduncle; recovery.*—(Reported by Mr. Butcher).—Ann J—, a single woman, æt. 37, was sent to Mr. Bryant by Mr. Cockell, of Dalston, as a fit subject for Ovariectomy. She

was a native of Tewkesbury, in Gloucestershire, and a school-mistress. She had always had good health, but had never been regular, and the catamenia had appeared but once since March.

She was admitted into Guy's Hospital on September 25th, 1863, under the care of Dr. Oldham and Mr. Bryant. One year previously she first observed her abdomen to be somewhat larger than natural, and this enlargement gradually increased; for the last three months the increase had been very rapid. When admitted her abdomen was tense, and distended by a tumour, which was evidently multilocular. The uterus was quite free. Her general health was good, although her powers were not strong. Tonics were given.

The subject of the removal of the tumour was then discussed, and its dangers explained to the patient, who, however, expressed a wish for its performance.

On October 16th the operation was therefore carried out. The patient was placed in a private room, and precautions taken similar to those adopted in the former cases. The abdomen was opened by an incision six inches long, and a cyst tapped, some thick gelatinous fluid being drawn off. The abdominal opening was then increased about one inch, as the tumour did not readily escape from the abdomen, this small addition easily allowing the cyst to be drawn out. The tumour was well supported during its escape, and the wound closed by the hands of Dr. Hicks, the intestines being thus kept from view. The pedicle was narrow, and tolerably long. The clamp was therefore applied, and the tumour removed. The edges of the wound, with the peritoneum, were then brought together by wire sutures, deep and superficial, water dressing being applied. The patient was then placed in bed, and a suppository of the compound soap pill administered. Some slight vomiting followed the operation, but this soon ceased. 10 p.m.—Had slept one hour. Abdomen flaccid, although the patient felt a little flatus. Pulse 100. Skin and tongue moist. Urine to be drawn off at regular intervals.

17th, 4 a.m.—Has slept for nearly two hours, and awoke free from all pain, a fresh suppository having been given at two o'clock. 4 p.m.—Has slept again, and is still quite comfortable. Pulse 90. Good power. Suppository to be repeated.

18th.—Slept at intervals all night; is as comfortable as one could wish. The slough beyond the clamp excised. Beef tea ordered.

19th.—The clamp was removed this morning. Wound looking well. Countenance free from all anxiety. Wine 3vj.

22nd.—The upper part of the wound has healed. Pedicle granulating.

26th.—Progressing most favourably. Chicken for dinner, and wine. Bowels rather uncomfortable. Enema of warm water given, with great relief.

29th.—Pedicle granulating rapidly.

November 5th.—Convalescent, wound having nearly closed.

10th.—Cured.

Some months subsequently to her leaving the hospital this patient unfortunately died, the following note from Mr. Clarke indicating the cause—

47, HIGH STREET, OXFORD;

January 18th, 1864.

DEAR SIR,—You will be sorry to hear that Miss J—, your late patient at Guy's, died on the 10th instant, of pericarditis.

It came on very insidiously, being preceded by hectic symptoms and incontrollable but not excessive diarrhoea.

She had good nursing and attendance, and was not placed in circumstances likely to bring on such an attack. There were no particular abdominal symptoms beyond those incident to a relaxed condition of the bowels—I mean no great tenderness, undue distension, or anything of that kind. The wound healed absolutely, leaving a clear and clean cicatrix.

I am, dear Sir,

Yours truly,

FRANCIS W. CLARKE.

T. BRYANT, Esq.

CASE 9.—*Multilocular ovarian tumour; Ovariectomy; clamp to peduncle; recovery.*—(Reported by Mr. Long.)—Sarah C—, æt. 50, a married woman, but without children, was admitted into Guy's Hospital on November 25th, 1863, under the care of Dr. Oldham and Mr. Bryant. She was a resident of Cheshunt, and had been sent up to Mr. Bryant for operation by Mr. Stormont, under whose care she had been. She was a healthy looking woman, never having had any illness till eighteen months ago, when her present disease first appeared; it grew from her left side, and its increase was very gradual. In October last her size was so great as to require relief; she was consequently tapped, and sixteen quarts of fluid were drawn off; this, however, rapidly re-formed, and she was tapped again on October 30th. When admitted, on November 25th, she was as large as ever; the abdomen was distended to its utmost, and she was in great pain. The tumour was evidently multilocular. A pelvic examination was made, and the uterus was found to be quite moveable.

The subject of Ovariectomy was discussed, and the patient's consent readily secured. Some iron was given to her for some days before the operation.

On December 2nd, the patient having been moved into a private ward, the operation was performed, Drs. Oldham and Hicks kindly assisting.

A small incision into the abdomen was made, and the peritoneum opened, when a quantity of mucoid fluid escaped, analogous to that in an ovarian cyst. The presence of this fluid at first made Mr. Bryant and others believe that the cyst had been opened, but on examination it was evident that this was not the case, for the tumour was seen within the abdomen with an opening into it, which was freely discharging its mucoid contents into the peritoneal cavity; this opening had evidently been the result of the former tapping, the opening into the cyst never having healed. The tumour was then removed, the wound having been enlarged, and its pedicle secured by means of the clamp. The wound was closed with wire sutures, and an opium suppository administered. Some sleep followed the operation, and at 12 p.m. her pulse was 80. She was free from pain; abdomen flaccid; tongue moist.

December 3rd.—Has slept nearly the whole night. 6 a.m.—Pulse 84, and of good power; tongue and skin moist; abdomen flaccid; some arrowroot ordered. 9 p.m.—Still very comfortable; suppository to be repeated.

4th.—Nothing unfavourable to record.

5th.—Still going on well; repair progressing satisfactorily; pulse 80; beef tea and arrowroot taken freely.

7th.—Clamp removed, the slough having been previously excised; solid food taken, with wine $\frac{3}{4}$ iv.

9th.—Sutures removed, the wound having united.

11th.—Bowels open for the first time since the operation, after an enema; has some slight cough.

13th.—Cough better; wound nearly well; takes food readily with appetite.

17th.—Can sit up in bed without pain; feels quite well; wound has nearly closed.

23rd.—Wound healed completely.

25th.—Cured; left the hospital.

CASE 10.—*Multilocular semi-solid ovarian tumour; Ovariotomy; peduncle ligatured and dropped in; wound closed; fatal result.*—(Reported by Dr. Walter Beeby).—Amelia A—, æt. 62, a married childless woman, was admitted into Guy's Hospital, on Feb. 11th, 1864, under the care of Dr. Oldham and Mr. Bryant, having been sent up from Ashford, in Kent, for operation by Mr. Thurston. She was a dark and somewhat cachectic looking woman; but she had always enjoyed good health. Her catamenia had been regular, at times had been attended with pain, and for some years the discharge had been somewhat scanty before it had ceased. For ten years she had observed that her abdomen was somewhat larger than natural, this fulness varying at different times, but for the last seven months the increase had been more rapid. She had occasionally experienced some little abdominal pain. She had never been tapped.

On admission a semi-solid multilocular ovarian tumour was readily diagnosed. The growth appeared to have sprung from the right side. The abdomen measured thirty-three inches round and fifteen from umbilicus to pubes. A careful pelvic examination revealed the fact that the uterus was

quite free and moveable, although somewhat drawn upwards. Upon the whole the case was regarded as a fair one for operation. The patient's consent having been readily obtained, some iron mixture was given for about two weeks, and on Feb. 25th, at 2 p.m., the operation was performed. An incision about four inches in length was first made, and the tumour exposed; but as the growth was nearly solid, and it was found impossible to extract it through such a small wound, the incision was increased upwards to about one inch above the umbilicus. The tumour was partially emptied by tapping, and nearly drawn out; some few omental and visceral adhesions, which were found to exist, were divided and torn through. The omentum having been previously tied, the ends of the ligature were brought out at the upper part of the wound. The pedicle, which was a very short and broad one, was secured in three portions by strong whipcord ligatures; the ends of the ligatures were cut off, and the pedicle allowed to drop back into the pelvis. The pelvis was then carefully sponged out, and the wound closed by means of deep silver, and silk superficial sutures. A piece of dry lint was applied to the wound, and a ten-grain suppository administered. Some vomiting followed upon her recovery from the chloroform, after which she slept for about a quarter of an hour. On waking, the patient vomited slightly, but remained in a drowsy state, not feeling any pain, except when vomiting. The urine was drawn off. Ice ordered to suck. 7 p.m.—Another suppository was given. 10 p.m.—Patient is drowsy; no vomiting has taken place for four hours. Pulse 88; abdomen flaccid.

Feb. 26th, 8 a.m.—Passed a quiet night, although she was at uncertain intervals disturbed by vomiting, accompanied by pain. Pulse 108. Tongue moist. Abdomen slightly tympanitic. Suppository ordered every six hours. 1 p.m.—Patient much the same; complains of pain in the right inguinal region. Milk and ice given; but as the milk seemed to increase the vomiting, ice alone was administered. During the day the patient remained much the same; but in the evening the pulse became more feeble. Beef tea injections were given.

Feb. 27th.—No change during the day. Beef tea and brandy enemata were given every four hours and retained.

Hot fomentations applied to the abdomen. 10 p.m.—The patient became very faint; pulse 130. Some brandy was given by the mouth, with benefit; and an injection with opium, after which patient slept from 11 to 5 a.m., during which time her breathing was very hard. On waking she expressed herself as feeling much better. She was free from pain. Pulse 130, and running. Brandy and arrowroot given at short intervals in small quantities, and retained. Suppository given. 3 p.m.—Patient drowsy from opium. Pulse not so feeble. Slept from 6 p.m. to 11, and on waking was slightly delirious. Vomiting returned, and enemata also rejected. She slept a little towards the morning of March 1st, and on waking suddenly became faint; and died at 5.45, March 1.

Autopsy.—Abdomen contained some blood and some serous fluid; no peritonitis. The pedicle contained part of the cyst, which was ligatured; no neck existing between the cyst-wall and the uterus. The incision in the abdominal walls had united well; viscera healthy.

CASE 11.—*Multilocular ovarian cyst; Ovariectomy; clamp to peduncle; and recovery.*—On April 26, 1864, I was asked to see the case of Miss W—, of Watford, with Dr. Brett.

She was a healthy looking woman, aged 34, and had always experienced good health till August last, when it began to fail; and it was at this date that she first observed her abdomen to increase in size. The increase had been gradual, but steady since.

On April 4th, she consulted a physician of some eminence, who tapped the growth, and drew off four quarts of a dark-coloured fluid; but she soon refilled, and when I saw her the abdomen was tense, and measured 40 inches in circumference. On making a pelvic examination, the uterus was found to be healthy and free, moving readily upon the finger.

Her catamenia were regular. There were no points in the case contra-indicating an operation.

On May 21st, at 3 p.m., the operation was performed, Dr. Hicks, Dr. Brett, and Mr. Codd kindly assisting. Chloroform was given. A short incision was made at first; but it had subsequently to be enlarged, as the tumour was too solid

to be extracted through a small wound, and many parietal adhesions existed. These, however, were readily broken down, and the tumour removed. It was found to have a narrow and long pedicle; and as there was no probability of any traction upon the pelvic viscera being made by the fixture of the pedicle externally, a clamp was applied. The wound was closed—after the pelvis had been sponged out—by means of silver sutures, an opiate suppository administered, and the patient put to bed. The tumour was semi-solid, and weighed 12 pounds. No nausea or vomiting ensued, after the operation; and at 8 p.m. she was as comfortable as possible. She had been dozing. Pulse 84, and steady. Urine drawn off regularly.

22nd, half-past 8 a.m.—Had passed a quiet night, having slept six or seven hours. She expressed herself as feeling quite well. Her aspect was good. Tongue clean. Pulse 84, and of good power. Abdomen flaccid; no nausea or sickness. Some cold arrowroot ordered. 10 p.m.—Still the same in every respect; no alteration in any point. Has enjoyed her arrowroot, which was ordered to be repeated, as the patient expressed herself as feeling hungry. A suppository ordered.

23rd.—Slept seven hours last night, and this morning feels quite comfortable. Countenance natural; skin pale; and tongue all that could be desired. Abdomen the same as it was after the operation.

24th.—All going on well. Slept soundly all night. She is quite free from all pain. Extremity of sloughing pedicle cut off.

25th.—Still going on favourably. Sleeps well, and free from pain. Takes beef tea and arrowroot with appetite. Clamp removed, and slough separated. Wound looks healthy, having apparently united. Fish ordered for tomorrow.

27th.—No unfavourable symptom to be recorded. Wound has united. Sutures removed.

29th.—The patient is really convalescent. Wound has healed, one deep suture, near the pedicle, alone remaining.

June 3rd.—Still going on well. Stump granulating. Has had an enema to relieve her bowels, with benefit. Takes food well.

7th.—The catamenia have appeared, but are unaccompanied by any distressing or bad symptoms.

10th.—The patient was up to-day, and could walk without pain, with the support of a good bandage.

August 9th.—The patient called on me, and was in all respects well. She told me, however, that at her last catamenial period there was an additional discharge of blood from the stump of the pedicle, and this lasted for two days.

When I saw her again in June, 1865, she reported that this discharge of blood ceased to show itself at Christmas, 1864, having continued for about six or seven months after the operation.

CASE 12.—*Proliferous ovarian cyst; Ovariectomy; clamp to peduncle; recovery.*—(Reported by Mr. H. R. Smith).—Emily N—, æt. 33, a married woman, the mother of two children, was admitted into Guy's Hospital, under the care of Dr. Hicks and Mr. Bryant, on May 4th, 1864. She was a native of Bedfordshire, was of a healthy aspect, and had always enjoyed good health.

After her last confinement, one year and nine months since, when nursing her child, she was seized with a severe bearing down pain in the lower and left side of her abdomen, accompanied with sickness and constipation. By care and treatment these symptoms subsided, and in about a month she was declared to be convalescent. She then discovered a tumour in her right side, about the size of a large apple—it was globular, and somewhat tender to the touch, this last symptom becoming aggravated at each menstrual period. The tumour increased slowly for some months, but about Christmas it began to grow very rapidly, and, feeling anxious about it, she came up to town for advice, and was admitted into Guy's.

At this date, May 4th, she was in excellent health, and was suffering no pain beyond that occasioned by the abdominal enlargement. There was no difficulty in making the diagnosis of the case, it being clear that a multilocular ovarian tumour existed. The uterus also, on a pelvic examination, seemed moveable and not involved in the disease.

On June 15th, at 1.30 p.m., the operation of Ovariectomy was performed. A moderate incision was made, through

which the tumour readily escaped, no adhesions being present. The pedicle was sufficiently long to allow of its being fastened by a clamp outside the wound without producing any injurious traction upon the uterus. The pelvis was not sponged out, as no fluid or blood had escaped into its cavity. The wound was brought together by deep and superficial sutures, the peritoneum being included in the former, and a suppository of opium given.

There was no vomiting during the operation, but on recovering from the effects of chloroform it became somewhat troublesome. At 4.30 p.m. a second suppository of opium was given on account of pain. The pulse was then 80. Abdomen flaccid. At 7 p.m. she vomited again, having experienced nausea since the operation.

June 16th, 5 a.m.—Slept for several hours during the night at uncertain intervals. Her general aspect is very good, and she expresses herself as being comfortable. Pulse 90, and of good power. Abdomen flaccid. Urine natural when drawn off. 7 p.m.—still comfortable in all respects, having passed a quiet day. An opiate suppository given.

17th.—Passed a quiet night and feels well this morning. Pulse 92. Abdomen free from pain and all distension. Has taken some arrowroot and beef-tea with appetite. Suppository repeated.

18th.—Going on well in every respect. Abdomen quite natural. Pulse 100. Clamp was removed, the stump looking healthy. At 7 p.m. she had some pain from the presence of flatus, but this soon passed, with immediate relief, a warm fomentation being applied.

19th.—Passed a restless night on account of some abdominal pain, which was clearly caused by wind. Countenance somewhat anxious. Tongue dry. Pulse 112. A little compound spirit of ammonia in mint water was given with advantage.

20th.—Much more comfortable this morning, the abdomen being free from pain or distension. Tongue clean. Pulse 112. Wound healthy. Has some irritability of bladder, urine being cloudy, and containing ropy mucus, evidently from the catheterism. Has taken some solid food with appetite.

21st.—Doing well in all respects. Enjoyed some chicken for dinner. Wound looking healthy.

22nd.—Going on favourably; appetite good. All the sutures were removed to-day, the wound having healed.

24th.—Progressing well in all respects.

26th.—Has experienced some little abdominal pain from want of the action of her bowels. These were relieved on the administration of an enema; in other respects she is quite comfortable.

30th.—Still going on well, wound having completely healed, and the extremity of the pedicle granulating freely. In about two weeks this had quite healed, and she left the hospital in all respects sound and in good health.

For upwards of six months, at each catamenial period, this patient experienced a discharge of blood from the extremity of the pedicle, but after that it ceased. She is now quite sound in all respects.

CASE 13.—*Polycystic ovarian tumour; Ovariectomy; clamp to peduncle; death.*—(Reported by Mr. H. R. Smith.)—Sarah M—, æt. 46, a married woman, the mother of one child, was admitted into Guy's Hospital, under Dr. Oldham and Mr. Bryant. Came on June 11, 1864, having been sent in by Mr. Chabot, of Camberwell, for operation. She had always enjoyed good health till August last, when she first experienced pain in her right iliac region, which lasted for a few days, and disappeared; again, however, to recur at uncertain intervals. At this time she also observed, in taking food, that her abdomen became swollen and somewhat painful; from this date the increase in size became gradual, but no tumour was detected.

The catamenia had been regular till the last five months, since which time she had not seen anything.

On admission her abdomen was very tense, and measured 45 inches in circumference, and 27 from umbilicus to pubes. It was clear, also, that a multilocular ovarian tumour existed. On making a pelvic examination, the uterus was found to be free, and uninvolved in the disease. Her general health was not bad, although from the abdominal distension it had latterly declined.

It was looked upon as a favourable case for operation. She had not been tapped.

On June 24th, at 1.30 p.m., the operation of Ovariectomy was performed by Mr. Bryant, a moderate sized wound having been made. There was much ascitic fluid within the abdomen, and many parietal adhesions in front of the cyst, but these were readily broken down. The pedicle was of small size and of good length, being readily kept outside the abdomen; it was secured by a clamp.

The tumour was polycystic, and contained about 40 pints of fluid, each cyst presenting a different form of serous secretion; it was in the left ovary. The pelvis was sponged out with a soft, warm sponge, some blood having gravitated into it from the torn adhesions; and the wound was brought together by wire sutures, the peritoneum being included in the ligatures; and an opiate suppository was given.

She had taken but two drachms of chloroform during the operation. Some vomiting followed the operation as she recovered her sensibility, but this did not recur. At 11 p.m. she was very comfortable, being quite free from all pain, and had had two or three hours' good sleep. Abdomen as it was left after the operation.

Urine was drawn off at stated intervals.

25th.—Has passed a good night, having slept quietly till 6 a.m. She has been quite free from all pain; pulse 112. Tongue clean. Abdomen flaccid. Urine healthy. Suppository repeated.

26th.—Had a good night, and is in all respects very comfortable. Nothing to be recorded. Has taken some arrowroot and milk, with appetite.

27th.—Still going on well. Pulse good. Wound healthy. Has passed urine naturally.

28th.—Is not quite so well this morning, having had some little abdominal pain, apparently from flatus. Pulse 100. The clamp was removed, as were some of the sutures. She has had some beef tea. Towards evening a little feverishness appeared, but otherwise there was nothing to cause anxiety. At 11 p.m. she vomited, the fluid containing bile.

29th.—Passed a restless night, and this morning she is evidently more feeble. Pulse 100. Tongue dry. Abdomen

flaccid, but in right iliac fossa there is some tenderness and induration, apparently from suppuration. An enema of beef tea was given, and repeated with benefit.

30th.—She is somewhat better this morning, but still feeble. During the day enemata have been given every four hours, with benefit, and much wind passed with relief. The right side of the abdomen is evidently harder than natural.

July 1.—Had a restless night, and this morning she again vomited. Pulse 120, and very feeble. The whole of the sutures were removed, and from several of the lower openings pus escaped. This welled up on pressure over the abdomen. The wound was accordingly slightly separated with the fingers, pus freely escaping. Fomentations were applied.

2nd.—The hardness of the abdomen has nearly disappeared, a free discharge of pus having taken place. She is certainly better this morning.

3rd.—Abdomen becoming more natural, and pulse rallying. Discharge less from the wound. The bowels have acted freely two or three times, and are somewhat loose. Diarrhoea then set in, and in spite of all treatment it continued unchecked, the patient sinking on the 8th, fourteen days after the operation.

After death it was found that the original wound had united well, except at its lowest part, where an opening existed, through which pus escaped. This sinus led to a circumscribed cavity, between the abdominal walls and the pedicle of the tumour. On opening the abdomen this abscess was opened, and it was thought that pus had escaped into the abdominal cavity. There was distinct evidence of general peritonitis, and from the nature of the effusion, which was firm, it was believed that this peritonitis had been of some standing. The small intestines were inflated. Viscera healthy.

CASE 14.—*Polycystic ovarian tumour, in a patient æt. 62; Ovariectomy; clamp to peduncle; rapid recovery.*—On May 7th, 1864, I was requested by my friend, Dr. Brett, of Watford, to visit a single lady, æt. 62, residing in his neighbourhood, who had been the subject of some abdominal enlargement for several years. The patient had, however, thought

but little about it, and had never sought advice, till two weeks previously, when, on account of the abdominal distension, she consulted Dr. Brett.

When I saw her her general health was good in every respect. Her abdomen was much distended with what appeared to be one large fluctuating cyst. This occupied the anterior portion of the cavity, the intestines having been completely pushed backwards into the loin. On making a pelvic examination, the pelvis was found free, uterus mobile, and apparently unconnected with the cyst.

The operation of tapping was then performed, twenty-three pints of a thick mucoid fluid being drawn off. Upon its withdrawal, the walls of the abdomen collapsed to a most marked degree, no solid growth being then apparently present. Much relief was given to the patient by this operation; but it was of brief duration, for in about four months time, the cyst had re-filled, and her discomfort from the abdominal distension was as great as ever.

On Sept. 13th, I again saw her, with Dr. Brett. I found her in good health, and that she had gained flesh since the last operation. But her abdomen was again large, and the cyst tense, and the time had arrived when relief must again be given. I then placed before her the question of a fresh tapping, or the removal of the cyst, Dr. Brett regarding the case with me as a good one for Ovariectomy. Her decision was at once given in favour of the radical cure, or rather the attempt, and on Sept. 17th, I proceeded to operate, being kindly assisted by Dr. Brett, Dr. Braxton Hicks, Mr. Codd, and Mr. Evans.

The patient was put under the influence of chloroform, and a small incision, about four inches, made in the median line. Some parietal adhesions, which existed in front of the cyst, and which had evidently been the result of the former tapping, were broken down, and the cyst tapped, twenty-four pints of a dark mucoid fluid being drawn off. The cyst was then steadily drawn out, and two omental adhesions came into view; one of these was readily separated, but the second had to be ligatured and divided, the ligatures being drawn up to the upper part of the wound. The left pedicle was then brought into view, and found to be a broad one, and

somewhat short. It was secured by means of the clamp, and the cyst removed. The edges of the wound, with the peritoneum and muscular structure, were brought together by means of deep and superficial sutures, a ten-grain suppository of the compound soap pill was administered, and the patient placed in bed.

The cyst was then examined, and found to be one of the proliferous kind, a solid mass, the size of an orange, existing in its lower parts, many intra-cystic growths springing from the lining membranes of the parent cyst.

At 10 p.m. she was found to be quite comfortable, and free from pain; no vomiting had taken place. Pulse 100, and of good power. Tongue clean, skin moist, abdomen flaccid. Suppository to be repeated at 2 p.m.

18th, 9 a.m.—Comfortable in all respects. She had passed a quiet night, dozing and sleeping throughout. Pulse 100; tongue as before; abdomen as it was left after the operation, being quite free from pain. Urine, when drawn off, healthy. Milk and arrowroot ordered.

19th.—Going on well. Passed a good night. Has taken nourishment with satisfaction. Pulse, tongue, skin, and abdomen, everything that could be desired. Beef tea and jelly given.

20th.—Still progressing favourably. Extremity of sloughing pedicle removed with the scissors. Wound looking very healthy.

24th.—Doing splendidly. Not one bad symptom. Bowels acted naturally, on 21st, without pain. Sutures removed, and wound healed. Takes wine and food well.

27th.—Removed the clamp. Wound healed; stump healthy.

30th.—Still going on well in every respect. The granulated end of stump alone remains to cicatrize.

Oct. 3rd.—Still progressing favourably. Sleeps and takes food satisfactorily. Has been sitting up in bed.

From this date everything went well; the stump had cicatrized by the 15th, and the wound had completely consolidated, the patient having made a good recovery.

This lady is now in excellent health.

CASE 15.—*Monocystic ovarian tumour ; Ovariectomy ; clamp to peduncle ; death from acute bronchitis.*—I was consulted by Dr. Fowler, of Kennington, on October 18, 1864, on the case of Mrs. P—, æt. 55, of Hackney, who had experienced a gradual enlargement of the abdomen for one year and a half. Mrs. P. was the mother of four children, the youngest being ten years of age ; and she had always experienced good health ; her general aspect was also healthy. For one year and a half she had observed her abdomen gradually to enlarge ; this enlargement was not, however, associated with any pain. On July 18th she had been tapped, and twenty quarts of a dark coloured fluid were drawn off, but she gradually refilled, and, when I saw her, the abdomen was very tense. On examination, there appeared to be but one large tense cyst in the abdominal cavity, and, on making a pelvic examination, the uterus was found to be quite free. Her general health was very good. The case appeared to be a good one for Ovariectomy. The patient's consent having been obtained, the operation was performed on November 4, at 2 p.m., Dr. Hicks, Dr. Fowler, and Mr. Mead kindly assisting. A moderate incision, commencing one inch below the umbilicus, was made, and the cyst tapped ; many firm anterior parietal adhesions were then broken down, and, one omental adhesion was ligatured and divided ; the cyst was then readily extracted ; the pedicle, which sprung from the right side, was long and narrow, and readily fixed by means of a clamp ; the pelvis was then sponged out, and the wound carefully closed by deep and superficial sutures, the peritoneum and muscles being included. An opiate suppository was then given.

It is to be noted that this patient when taking chloroform at times coughed violently, evidently from the irritation of the vapour, but, otherwise, there was nothing to notice in its administration.

10 p.m.—She was very comfortable as far as her abdomen was concerned, but complained of a little cough ; this did not, however, cause any anxiety.

November 5.—She passed a quiet night, although her cough disturbed her at times, and there was evidently some little bronchial mischief. Her abdomen was flaccid and free

from tenderness, everything appearing to be quite right. Pulse 100, and of good power. A little squills and morphia was ordered every four hours.

By 12, noon, her cough had become very troublesome, and she experienced some difficulty in the act, on account of the abdominal incision; and from that time it rapidly became worse, actually suffocating her at 3 p.m. Twenty-four hours after the operation, at 4 p.m., a partial post-mortem of the abdomen was made, and the appearances observed were most interesting. The abdomen appeared much as it had been left after the operation. On removing the clamp, the pedicle did not retract, and the wound had become fairly glued together; on separating this with the knife with great care, a firm layer of lymph was at once seen, completely shutting the wound out from the abdominal cavity, and in the hollow formed by this lymph and the pedicle, some fluid was present; which, on being collected in a glass, readily coagulated into a firm clot. There was no blood in the pelvis, nor any evidence of peritonitis or disease of the viscera.

REMARKS.—This was clearly a case of death from acute bronchitis, which had been apparently set up by the administration of chloroform. The patient had been evidently suffocated, having lost all power of coughing on account of the incision into the abdominal muscles.

CASE 16.—*Proliferous ovarian cyst; Ovariectomy; peduncle ligatured and dropped in; wound closed; adherent cyst; death 29 hours after operation from hæmorrhage.*—Mary P—, æt. 36, was admitted into Guy's Hospital on October 15, 1864, under the care of Dr. Oldham and Mr. Bryant, having been the subject of an abdominal tumour for seven years. She was a single woman, and had always had good health, the catamenia having been very regular. She had observed her abdomen to enlarge about seven years previously, and this enlargement had steadily increased. On admission, her abdomen was tense, and measured 56 inches round; the surface of the tumour was smooth, and this was, apparently, made up of one large cyst. A pelvic examination indicated that the uterus was free. The question of Ovariectomy was

discussed, recommended, and assented to on October 25, and it was performed, under the influence of chloroform. On opening the abdomen, the cyst was found firmly adherent to the abdominal parietes in front, and, on attempting to separate it from the abdominal wall, the cyst ruptured in several parts, its coats being excessively thin, and in parts translucent; there were no adhesions to the viscera. Considerable difficulty was experienced in the removal of the cyst on this account, but it was soon accomplished; some portion of the cyst wall was, however, left in the upper part of the wound, some ligatures were put on at the spot at which it was divided. The pedicle of the tumour, which was long and narrow, was readily secured by means of ligatures. The ends of all were cut off, and the wound closed, an opiate suppository was given.

The patient went on favourably for some hours, and even passed a quiet night; but at 6 a.m. on the morning of the 17th, she was suddenly seized with abdominal pain and sickness. The pulse became feeble, and at 5 p.m. she sank.

After death, it was found that some hæmorrhage had taken place at the abdomen, one of the ligatures of the adherent cyst—not of the pedicle—having given way.

CASE 17.—*Multilocular ovarian tumour; Ovariectomy; peduncle ligatured and dropped in; wound closed; death.*—(Reported by Mr. Roberts.)—Ann B—, æt. 25, was admitted into Guy's Hospital on November 21, 1864, under the joint care of Dr. Hicks and Mr. Bryant. She was a married woman; the mother of four children, and had had good health till one year previously, when she first observed her abdomen to enlarge, and from that time the increase had been rapid.

On admission, a multilocular ovarian tumour was readily diagnosed; she was then tapped, and six quarts of fluid were drawn off. When she had convalesced, her health not being very good, she was advised to leave the hospital for the country, which she did, but, finding her health become worse, she returned at the end of two weeks. Under these circumstances, the expediency of an operation was discussed, for it

was clear that life could not long be prolonged without relief, and the tumour was of such a nature that tapping offered but a poor prospect of affording ease. It was, consequently, determined, with the patient's wish, to have the operation of Ovariectomy performed. On January 10th, the patient being under the influence of chloroform, Mr. Bryant made a moderate incision from the umbilicus to the pubes down to the cyst, upon which some ascitic fluid escaped. The cyst was then tapped, and partially emptied, the tumour being readily extracted through the wound; no adhesions existing. The pedicle, which was on the left side, was long and thin; it was ligatured in halves and divided with the ligatures, the whole being dropped in, and the wound closed.

A small quantity of morphia was then injected beneath the skin of the arm, and the patient put to bed. She remained quiet for some hours, and at half-past 11 awoke in pain; an opiate suppository was then given.

January 21.—Passed a restless night, having vomited at times. Pulse 114. Tongue moist. Abdomen somewhat distended. Urine healthy.

Jan. 21.—Slightly worse. Peritonitis evidently existing.

From this time she gradually went down hill, and died January 28th, on the eighth day, from peritonitis.

A partial post-mortem examination was only made—marked evidence of peritonitis existed, the bowels being bathed with pus, and flocculi of ill-organised lymph existed between the coils of intestines.

The extremity of the pedicle was found lying in the pelvis, as it had been dropped in; no signs of its seclusion from the pelvic cavity being present.

This patient had evidently not sufficient power to bear up against the effects of the operation.

CASE 18.—*Monocystic ovarian tumour; Ovariectomy; recovery; peduncle ligatured and dropped in; wound closed.*—A stout but otherwise healthy woman, Mary L—, æt. 43, was admitted into Guy's Hospital under my care, on Dec. 14th, 1864. She was married and had nine children, the last six years previously.

Nine years ago she accidentally discovered a swelling in the right side of her abdomen; it was painless, and caused her little distress; its growth was gradual, but since her last confinement, six years ago, had increased more rapidly.

When admitted she was in good health, and in very fair condition, being rather stout. Her abdomen was very large and tense, measuring 49 inches in circumference. A single ovarian cystic tumour was made out. On making a pelvic examination the uterus was found to be free, although drawn a little towards the right side. Ovariectomy was proposed, and the patient's assent secured. On Jan. 20th, it was performed, at 2 p.m., Drs. Oldham and Hicks kindly assisting. The abdominal incision was about four inches in length. There were no parietal adhesions. The cyst was readily drawn out of the wound without force. The pedicle was found to be long and narrow; it was secured with a double ligature, in halves, and dropped in, the ligature being cut off close. A long and firm pelvic adhesion, which was larger than the pedicle, was then treated in the same way, and the wound closed, deep and superficial sutures being employed.

Half-a-grain of morphia in solution was then sub-cutaneously injected, and the patient placed in bed. This injection took effect very rapidly, the patient being under its influence before she had recovered from that of the chloroform, and continuing partially so for at least three days. It caused some little anxiety, for the patient remained with a fixed and peculiar look for at least 24 hours, with a clammy skin, contracted pupils, and small pulse. She just swallowed what was put into her mouth, but was otherwise unconscious.

Towards the third day these symptoms abated, and she took food.

Repair in the abdomen, however, went on apparently satisfactorily, and a steady, uninterrupted convalescence followed.

This patient is now quite well.

CASE 19.—*Multilocular ovarian tumour; Ovariectomy; peduncle ligatured and brought out of wound; death on 6th day from peritonitis.*—I was consulted on May 8th, 1865, upon the

case of Miss E. S., æt. 20, a native of Devonshire, respecting an ovarian tumour, which had been growing for about three months. She was a healthy girl, having always had good health. Her catamenia had also been quite regular. Three months previously she had first observed her abdomen to enlarge, and this enlargement was very rapid. She had lost flesh during this time, but in all other respects was well in her general health. The abdominal distension was very great.

A multilocular ovarian tumour was readily made out by Dr. Oldham, who first saw the case, and on making a pelvic examination he reported that there were no uterine complications.

He agreed with me that the case was a good one for operation.

On May 13th, at 1.30 p.m., Ovariectomy was performed, Dr. Oldham and Mr. Bankart kindly assisting, with Messrs. Couling and Duke. A small abdominal incision was made; no adhesions existed. The tumour, having been diminished by tapping, was readily removed from the abdomen, and the pedicle secured in halves by two whip-cord ligatures. The pedicle and ligatures were then dropped back into the pelvis, the former being short, and the ends of the latter were drawn out of the wound. The disease was on the right side. There was no bleeding. Four deep sutures and four superficial were introduced. An opiate suppository was given, and the patient placed in bed.

At 10 p.m. she was very comfortable, having dozed repeatedly. Pulse 120, of good power. Countenance quiet. Ice was given to suck.

May 14th, 10 a.m.—Passed a quiet night, having slept some hours at intervals. There had not been any sickness. Pulse 120. Abdomen slightly distended. 10 p.m.—Complains of feeling sick, and is afraid to take anything into her stomach. Has some pain in her right iliac fossa. Abdomen by no means distended nor tender. Voice good.

May 15th, 10 a.m.—Is said to have had a quiet and satisfactory night. Has had no sickness, although fearing it. No pain in abdomen, except an occasional spasm. Pulse 130—more feeble. Voice weaker. A little beef-tea and brandy

was given with benefit. Towards evening she was worse. Abdomen more distended and painful. Rejects food. There is evidently peritonitis, and from this time the disease gradually made way, the patient's powers slowly failing, and death took place at 9 p.m., May 19th.

CASE 20.—*Multilocular ovarian tumour; previous tapping; Ovariectomy; peduncle ligatured and dropped in; wound closed; recovery.*—(Reported by Mr. Burrell.)—M. L—, æt. 17, was admitted into Guy's Hospital under the joint care of Dr. Oldham and Mr. Bryant, on April 20, 1865, having been sent up by Dr. Corbett, of Kingston-on-Thames, for operation. She was a single healthy girl till two years ago, when she first observed her abdomen to enlarge; and at this time her catamenia, which had been always regular, became the reverse. Her abdomen gradually filled, and in September last she was tapped, in St. Thomas' Hospital, twenty-five pints of a dark coloured fluid being drawn off. In two months time she began again to refill.

On admission, her abdomen was much enlarged, and measured 41 inches in circumference; it was very tense. The pelvis was found to be quite free.

May 20th.—Ovariectomy was performed, a long incision being made, the cyst being very large and semi-solid. A small incision was made at first, but subsequently increased to about one inch above the umbilicus, in order that the tumour might readily be removed, without force. Extensive parietal adhesions also existed in front, but these were readily broken down, with the exception of two, which, with one large omental adhesion, were ligatured and divided, the ligatures being cut off. The pedicle, which was on the left side, was broad and short; it was, however, ligatured in two portions, and dropped in, with the ligature cut off close. The wound was closed with silk sutures, deep and superficial, and a suppository administered.

At 8 p.m. she was very comfortable, although she had vomited once. Pulse 100, good power.

21st, 8 a.m.—Was quiet during the night, although she did not get much sleep. Vomited at intervals. Abdomen comfortable, and free from pain. Pulse 100, good power. No

vomiting after 9 a.m. Took milk and tea. Urine healthy, when drawn off.

22nd.—Slept well during the night, and this morning is very comfortable. Skin moist. Pulse steady. Countenance good.

23rd.—Is going on well. Last evening passed flatus, per anum, with ease. Abdomen flaccid, and free from pain. Pulse 120. Beef tea given.

Some diarrhœa came on in the afternoon; which was evidently caused by the beef tea. This food always, so she says, produces this effect. Mutton broth ordered.

24th.—Diarrhœa ceased, and expresses herself as being very comfortable. Sutures removed. Brandy \bar{z} iij. given.

25th.—Going on well. Bowels opened naturally. Fish taken for dinner.

From this date convalescence rapidly ensued. It was slightly retarded by some suppuration between the edges of the wound in one spot, but she left the hospital, cured, on July 10th.

CASE 21.—*Multilocular ovarian tumour; tapping and Ovariotomy; peduncle ligatured and dropped in; wound closed; recovery.*—On July 25, 1865, I was asked to see Miss N—, æt. 43, with Mr. Fagge, of Hythe, Kent, for an ovarian tumour, with a view to its removal. She was a healthy single woman, and had observed that her abdomen was somewhat large for about one year and a half, but had never sought advice till about four months previously, when Mr. Fagge discovered the presence of the growth. At that time the abdomen was becoming tense, but not sufficiently so as to warrant interference; but by June 16, it became so large, and painful that tapping was employed, and 27 pints of a mucoid, blood-stained fluid were drawn off; a large mass of solid growth was then made out to exist. Within a few weeks the cyst rapidly refilled, with a return of all her old distress, and when I saw her she was in great pain; her abdomen was much distended, with what appeared to be one large cyst, measuring 45 inches in circumference and 25 vertically, but from the previous history it was clear much solid material co-existed with it. The pelvis was quite free from disease, the uterus being in its natural position, and quite mobile.

As Mr. Fagge, and Dr. Hilton Fagge, who was also present, regarded the case, with me, as a good one for Ovariectomy, the suggestion was made, and the patient's assent readily given.

On July 29th the operation was performed, the chloroform mixture having been administered by Dr. Fagge; Mr. Fagge, sen., and Mr. Fred. Fagge, with Mr. Thurston, of Ashford, kindly assisting. An incision was made, about six inches long, from above the umbilicus, and the cyst tapped, many anterior parietal and omental adhesions having to be torn through. The solid tumour was then removed, and a broad pedicle, which was on the right side, ligatured in three portions with stout whipcord, the ends of the ligatures, with the pedicle, being cut short off, and dropped in. The omentum had also to be ligatured in three places, the ends of these ligatures being brought out of the upper part of the wound.

The pelvis was then carefully sponged out, and the wound closed by means of deep and superficial silk sutures. A suppository was given, and the patient placed in bed. At 10 p.m. she was very comfortable, no vomiting having taken place. Pulse 90, and of good power. Abdomen as it was after operation. Urine healthy.

30th, 10 a.m.—Has passed a quiet night, although she did not sleep much. Had a second suppository, as she complained of pain over the sacrum, which gave relief. Pulse 99, and good power. Tongue clean. Countenance natural. Voice good. Urine clear. Took tea and milk with pleasure.

31st.—Mr. Fagge reported “that she had been sick early in the morning, bringing up some bile, with slight pain in her abdomen, but that after taking a little champagne she expelled flatus per anum, and was at once relieved. She then fell into a deep sleep and at 8 a.m. was much better. Abdomen soft, and free from pain. Tongue moist. Skin natural. No sickness. Countenance natural.

On August 1st, I again saw her, and found her very comfortable. Countenance free from all anxiety. Abdomen flaccid and painless. Pulse 90, and of good power. Tongue moist. Wound has apparently united. Asks for solid food. Beef tea, with bread, ordered, and champagne.

3rd.—Doing as well as she can. Removed sutures, the wound having united. Enjoyed chicken for dinner.

5th.—As well as possible. Bowels opened naturally this morning for the first time.

From this time recovery was very rapid, the patient being quite well and about on August 24th. It may here be noted that the tumour was multilocular, with some suspicion of colloid growth in the solid portion, but that no evidence of cancer existed.

It is to be remarked that during the treatment of this case the patient drew attention to the condition of her right breast, which had pained her at times for some weeks, and a kind of horror came over us, when it was discovered that the gland was the seat of a small infiltrating cancerous deposit. The question naturally arose as to the probability of a patient convalescing from such a severe operation as Ovariectomy who was the subject of a cancerous breast, but the result of the case told us how unnecessary were those fears, for in no instance which I have had to treat was recovery more steady and satisfactory. Still, the recovery was a sad one, for the operation would not certainly have been advised, had the presence of the cancer been previously known.

The subsequent history of this interesting case has to be related. This lady remained well for some time, but after the lapse of months, the disease in her breast gradually increased, and began to ulcerate, and about June, 1866, the presence of cancer within the abdomen also manifested itself.

On July 27th, I saw her, with Mr. Fagge, and found her very ill with an enlarged abdomen, evidently filled with nodules of cancer, apparently connected with the peritoneum. Tubercles of cancer existed around the original disease in the breast, which had not much increased, although it had ulcerated towards the sternum. There was great dyspnoea and evidence of cancer within the chest. All these symptoms had, however, appeared within six weeks. She speedily sank after this date, dying on August 14th.

CASE 22.—*Monocystic ovarian tumour; Ovariectomy; peduncle ligatured and dropped in; wound closed; recovery.*—(Reported by Mr. Henry Denne).—Sarah P—, a healthy young woman, æt. 25, was admitted into Guy's Hospital on

October 21st, 1865, under the joint care of Dr. Oldham and Mr. Bryant, with ovarian disease; having come up from St. Mary's Cray for operative relief.

She had first observed the existence of the tumour three years previously, but its increase was at first slow; she became pregnant and was confined two years since, and after that period the growth of the disease was more rapid, its increase being attended with some pain.

A monocystic ovarian tumour was readily diagnosed, and there was nothing in the condition of the pelvic organs to forbid the operation. It was accordingly performed on Nov. 1st at 2 p.m. The chloroform mixture was employed. A small incision was made of about four inches, and the cyst tapped. The cyst wall was very thin; no adhesions existed.

The tumour was readily extracted, and its pedicle, which was on the left side, ligatured in two portions, the ends of the ligatures being cut off, and the whole dropped in. The pelvis was not sponged out, as neither blood nor cyst fluid had escaped into its cavity, indeed, the hand had never entered the abdomen. Three deep and three superficial sutures were applied, including the peritoneum; an opiate suppository was administered, and the patient placed in bed. Ice was ordered. At 12 p.m. she was somewhat restless, from slight abdominal pain. There was no tension of the abdomen. Pulse 116, and soft. About half-a-pint of urine was drawn off, and another suppository administered.

Nov. 2nd, 8 a.m.—Slept but little during the night, although she is apparently doing well, complaining of pain down the inner side of the *right* thigh and knee. Pulse 100—feeble. 4 p.m.—Has slept for one hour. Pain in thigh relieved by fomentation. Has taken milk. 12.30—Slept for three hours. No pain in wound. No abdominal tension. Has taken some cold arrowroot instead of milk. Urine clear.

3rd.—Passed a good night and is doing well in every respect. Sutures removed. Wound united.

4th.—Going on well. Enjoyed beef-tea, arrowroot and brandy.

6th.—Still progressing satisfactorily. Chicken for dinner. Wound apparently quite healed. No abdominal pain. To all intents and purposes this patient is well.

8th.—Takes her food with appetite, and is quite free from all pain. Has had a natural motion of the bowels.

10th.—The pain down right thigh has returned, but the catamenia have appeared, which may probably explain it. Otherwise well.

This patient remained in the hospital for several weeks to gain strength. She left the hospital on December 19th, in all respects sound.

CASE 23.—*Proliferous ovarian cyst; tapping; Ovariectomy; peduncle ligatured and dropped in, and wound closed; recovery.*—Reported by Mr. Henry Denne.—Mary A. B.—, æt. 27, a married woman, the mother of four children, was admitted into Guy's Hospital, Dec. 10th, 1865, under the joint care of Dr. Oldham and Mr. Bryant, with the following history:—

After her *second* confinement, four years ago, she observed her abdomen to be large; she then consulted Dr. Oldham, who discovered an ovarian cyst, for which she was tapped, a pailful of clear fluid being drawn off. Twelve months ago, after her *fourth* confinement, the cyst again began to fill, and since that time it has steadily increased.

On admission, she was a thin, pale woman, with an anxious countenance; but her general health has not been materially interfered with. Her abdomen was distended, and encroached much upon her chest, the breathing being very bad. An operation was proposed.

Jan. 3rd, 1866, at 2 p.m., Ovariectomy was performed. A moderate incision was made by Mr. Bryant, and the cyst tapped. A few anterior adhesions were then torn through, and the cyst drawn out, when a mass of adherent omentum came into view. This was ligatured and divided, the ligatures being cut off short, and returned into the cavity. The tumour was then readily extracted, and the pedicle, which was on the left side, long and narrow, was ligatured in two portions, and the ligatures cut off short, the whole being returned. The wound was brought together by deep and superficial silk sutures, and a suppository administered.

The tumour was monocystic, but contained a small intracystic growth. It contained two pailful of a thick mucoid looking fluid.

11 p.m.—Is very comfortable. No sickness. Abdomen flaccid and free from pain. Pulse good, 88. Ice to suck.

January 4th, 8 a.m.—Passed a good night, having slept some hours, and is in all respects comfortable. Pulse steady at 88. Brandy and arrowroot given.

5th.—Had a quiet night, sleeping at intervals. Pulse, tongue, and abdomen, as before.

6th.—Progressing favourably. Passed flatus last night with relief. Abdomen flaccid and painless. Had some bladder irritation, evidently from the catheterism.

7th.—Going on well. Urine improved, having passed it without help. Taken beef tea and bread freely. Removed the sutures, the wound having healed by primary union.

From this time convalescence rapidly followed, the patient leaving the hospital on Feb. 1st, cured.

CASE 24.—*Polycystic ovarian tumour; Ovariectomy; peduncle ligatured and dropped in; wound closed; scarlet fever, and recovery.*—On March 7, 1866, Mrs. T—, a childless, married woman, æt. 52, was brought to me by Mr. Harold Giles, of Coggeshall, Essex, with an ovarian tumour.

She was a healthy woman and had observed her abdomen to enlarge for about two years; it had been painless, and caused but little inconvenience till within the last few months, when from her extreme size she had been at last induced to seek advice. She had consulted several surgeons and physicians, and amongst them my colleague, Dr. G. Owen Rees, to whom I am indebted for the treatment of the case. When I saw her she was in excellent health, and in no way affected, except from the size of her abdominal tumour. Her abdomen was very large, and evidently filled with a polycystic tumour; she measured 46 inches in circumference. A pelvic examination indicated that the uterus was free and uninvolved.

Mr. Giles agreeing, with me, that the case was a good one for operation, the suggestion was made, and with the patient's consent the operation of Ovariectomy was performed on March 14th, at 2 p.m., Mr. Harold Giles, Dr. Davidson, and my friends Mr. John Gill and Mr. Rootes kindly assisting. Chloroform was given, and an incision about five inches in length made, from the umbilicus downwards, and on opening

the abdomen some ascitic fluid escaped. The ovarian cyst was tapped, and about thirty pints of a dark coloured fluid drawn off. No adhesions were present. The cyst and tumour were readily removed, and the pedicle, which was on the left side and short, was ligatured in two portions, the ends of the ligatures being cut off, and the whole dropped in. No bleeding had occurred, nor had any fluid escaped into the pelvis, consequently it was not sponged out. The wound was then closed, by four deep and superficial silk sutures; an opiate suppository administered, and the patient placed in bed.

At 10 p.m. she was very comfortable, being quite free from all pain. The abdomen was just as it had been left after the operation. Pulse 90, and of good power. Tongue clean. Skin moist. Urine healthy.

15th, half-past 8 a.m.—Had passed a good night, having slept four or five hours. Asks for food. Countenance free from all anxiety. Skin, tongue, and pulse healthy. Milk and ice ordered.

16th, 6 p.m.—Still comfortable in every respect, being quite free from all pain. Abdomen flaccid and painless; wound apparently united. Has passed flatus per anum. Milk and brandy ordered.

19th.—I did not see her till to-day, Mr. Giles's daily report of her progress being most satisfactory. I found her tolerably well, with her abdomen flaccid and painless, the wound having united. Tongue clean. Pulse 100, and somewhat feeble. The sutures were removed. There was a distinct red rash, evidently of scarlet fever, over the whole body, and her throat was slightly sore. Chicken and wine ordered.

28th.—The scarlet fever rash had disappeared, and her throat had recovered. No bad constitutional symptom had presented itself. In all other respects she had gone on favourably. It was a matter of surprise that convalescence had gone on so favourably during the presence of scarlet fever. The wound had quite healed, and she eats, drinks, and sleeps well. This was my last visit.

On April 25th, I saw Mr. Giles, who reported that Mrs. T— was quite well, that some little suppuration in one point of the wound had taken place, and the skin of her body had

completely desquamated, evidently indicating that the eruption from which she had suffered, had been that of scarlet fever.

This point is one of special interest under the circumstances, for convalescence was in no measure retarded by the disease.

CASE 25.—*Polycystic ovarian tumour; tapping; Ovariectomy; peduncle ligatured and dropped in; recovery.*—(Reported by Mr. H. Greenway Howse.)—Margaret C—, æt. 22, was admitted into Guy's Hospital on April 30, 1866, under the joint care of Dr. Oldham and Mr. Bryant, having been sent in by Mr. F. Toulmin, of Hackney, for operation.

She was a single woman, and had always had good health, her catamenia having been very regular. About three months previously she felt a burning pain in her right side, and at this time noticed her abdomen to enlarge. On March 21st, she was seen by Dr. Oldham, who suggested tapping, when about seven pints of a thick, gelatinous fluid were drawn off. She rapidly refilled. When admitted she was larger than ever, and measured 36 inches in circumference. A polycystic ovarian tumour was made out to exist, and the uterus was found to be high up, and somewhat drawn to the left side. Some iron mixture was given.

On May 16th, at 2 p.m., Ovariectomy was performed. A moderate incision was made below the umbilicus, and the abdomen opened; some parietal adhesions were then torn through, and the cyst was tapped. The tumour was readily removed, and the peduncle, which was on the left side, ligatured in two portions, the ends of the ligatures being cut off, and the whole returned into the abdominal cavity. The pelvis was sponged out, and the wound closed. An opium suppository was given, and the patient placed in bed. The tumour was polycystic, and one cyst contained about a pint of pus, otherwise there was nothing peculiar in it. At 7 p.m. there was some sickness, but in other respects she was quite comfortable.

17th, 7 a.m.—Passed a restless night, having vomited at uncertain intervals. Pulse ranged from 100 to 116. Urine, when drawn off, healthy. Abdomen free from pain.

7 p.m.—Vomiting has subsided, and is generally more comfortable. Has found much comfort during the day from sucking ice.

18th.—Dozed a little during the night; feels sick, but has not vomited. At 10 a.m. vomiting re-appeared, when she brought up a large worm (lumbricoid). Milk and tea taken.

19th.—Going on very well to-day. Wound and abdomen very healthy. Sutures removed. Arrowroot and brandy given.

20th.—Passed a sleepless night, having had some abdominal pain. This morning she passed flatus freely with great relief. An opiate draught given at night.

21st.—At midnight had a fluid evacuation with some pain. Pulse 128. Repeat draught.

22nd.—Bowels quiet to-day. Tongue white. Pulse 120. Abdomen painless; urine natural. A draught of liq. opii. sed. mxx. and chloroform mx. at bed time.

23rd.—Diarrhœa has set in with some violence. Chalk and opium ordered.

25th.—Diarrhœa readily checked by the chalk mixture, and to-day she is much better. The wound has united.

28th.—Is still troubled slightly by a return of the diarrhœa, but the chalk medicine stops its progress; in all other respects she is doing well.

From this date to the middle of June, her bowels were more or less troublesome. They at last ceased to act more than naturally, and by June 21st, convalescence was established, this patient leaving the hospital quite well.

CASE 26.—*Monocystic proliferous ovarian cyst; Ovariectomy; Pedicle ligatured and dropped in; rapid recovery.*—(Reported by Mr. Henry Morris).—Harriet B—, æt. 19, and single, came up from Kent to be admitted under Dr. Oldham and Mr. Bryant's care, on November 29th, 1866, with an abdominal tumour, on the recommendation of Mr. Bushell.

She had always had good health, and had been regular up to March last, when she first observed a small swelling in the right iliac region, accompanied by pain of a throbbing character. This swelling had gradually increased. The catamenia had also been very irregular and profuse.

On admission her abdomen was very tense and distended, from what appeared to be one large ovarian cyst. The abdomen measured in circumference 38 inches. A pelvic examination was made, and nothing contra-indicating an operation was detected.

Some iron and chloric æther were ordered, with $\frac{3}{4}$ iv. of wine.

On December 12th, at 1.30 p.m., Ovariectomy was performed, the catamenia having ceased four days. Chloroform was administered, and a small incision, about four inches long made. The cyst was then seen to move freely in respiration. It was tapped, and as it emptied was drawn out, no adhesions existing. The pedicle, which was a broad one, but tolerably long, was ligatured in two portions, and dropped back, with the ligatures cut off short. The wound was then closed by silk sutures, the peritoneum not being included.

The peritoneum was not touched except by the knife in this operation, and not a finger was introduced into the abdomen. The fluid drawn off measured three gallons. The cyst was a proliferous one, with many growths from its lining membrane. Other small cysts existed in the ovary—a suppository was given.

Everything in this case went on most satisfactorily, not one symptom showing itself to cause anxiety. On the fourth day the wound having healed, the sutures were removed, no supuration having taken place, even in the line of suture. On Christmas-day she was allowed to get up, convalescence being declared.

ANALYSIS OF CASES.

Of these twenty-six cases seventeen recovered, or 65 per cent., and nine died, or 34.6 per cent.

In the two following cases, in which both ovaries were removed, a fatal result took place:—

CASE 1.—*Ovarian dropsy of both ovaries; Ovariectomy; peduncles ligatured; fatal result.*—Emma C—, æt. 32, a married woman, with one child, was admitted into Guy's Hospital, on April 10th, 1863, under the care

of Dr. Oldham and Mr. Bryant. She was a healthy looking woman, who appeared free from any other organic disease. The tumour was first observed, two years before her admission, on the left side ; its growth was gradual, and was unattended with pain, but in November, 1862, she became so large as to require tapping, when twenty-three quarts of a coffee-like fluid were withdrawn. She soon, however, refilled, and when admitted her abdomen measured forty-eight inches in circumference. A vaginal examination was made with great care, and the uterus found to be quite free, but a tumour evidently existed behind it in the pelvis.

The patient, having made up her mind to submit to the operation, was removed into a private room, and on April 15th Ovariectomy was performed by Mr. Bryant.

The operation was one of great difficulty, extensive adhesions firmly fixing the cyst to the abdominal walls, as well as to the viscera, including the stomach, liver, omentum, and bladder. The removal was, however, at last accomplished, and the pedicle of the large cyst fixed by thin whipcord ligatures, pieces of omentum being also tied and divided during the operation. The right ovary was then examined, and found to be diseased, the tumour resting in the pelvis behind the uterus ; this was also removed, and its pedicle fastened by two ligatures.

The edges of the wound were brought together with silver sutures, and the patient was placed in bed. She slept after the operation, but awoke very feeble. Sickness soon set in, followed by collapse and a gradual sinking, and the patient died twenty-two hours after the operation.

After death an examination revealed the existence of acute peritonitis. The viscera were otherwise healthy.

CASE 2.—*Polycystic disease of both ovaries; Ovariectomy; peduncle ligatured and dropped in ; death.*—(Reported by Mr. Ball.)—Emma A—, æt. 35, a housekeeper, residing at Croydon, was admitted on March 25, 1866, under the joint care of Dr. Oldham and Mr. Bryant. She was a married woman and had two children. Her general health had been always good. Eleven months ago she first noticed her abdomen to enlarge, but could not say whether it was on the right or left side. The increase has been steady and gradual.

On admission her abdomen was very large, and evidently contained a polycystic ovarian tumour. On making a pelvic examination, the uterus was found enlarged, high up and moveable, apparently being situated in front of the tumour. Quinine and iron were given.

The operation of Ovariectomy having been suggested and agreed upon, it was performed on April 14th, at 2 p.m. A large incision was made into the abdominal cavity, when some ascitic fluid escaped.

The cyst was then exposed, and many parietal adhesions torn through and divided, two being ligatured. The pedicle, which was a broad one, was transfixed and tied, the ends of the ligatures being cut off short. Some cysts were then discovered in the opposite ovary; this organ was consequently removed, after ligaturing the pedicle. The wound was then closed. The tumour was semi-solid and cystic. An opiate suppository was given, and the patient placed in bed.

8 p.m.—Has vomited a little after the operation. Complains of pains in her back, and is very restless. A second suppository was given, with marked relief.

15th, 8 a.m.—Had occasional vomiting during the night, and but little sleep. Some pain in her abdomen. Pulse 120, weak. A little brandy was given with some benefit.

Vomiting, however, continued, and other symptoms of peritonitis, the patient dying on April 16th, at 6.45 p.m.

APPENDIX

BY

J. J. PHILLIPS, M.B., LOND.,

DEMONSTRATOR OF ANATOMY AT GUY'S HOSPITAL.

The following tables contain an analysis of almost all the recorded cases of fatal ovarian disease which have occurred at Guy's Hospital during the last forty years, with the exception of those for which the operation of Ovariectomy was performed.

By the kind permission of the Curator of the Museum, and of the surviving physicians under whose care the cases were admitted, the post-mortem books were laid open to us, and we had hoped to have been able to draw up an analysis which would have furnished a contribution to the natural history of the different varieties of ovarian disease; but we regret that our primary object has been to some extent frustrated by the incompleteness of the records as regards the previous history of the patient and the duration of the disease.

Nevertheless, when it is remembered how comparatively few have been the published observations derived from actual post-mortem examination of such cases, and how difficult it is during life to decide as to the character of the tumour, or to determine which ovary is affected, or whether both ovaries are the seat of disease, these eighty-eight cases may be considered worthy of insertion in the present volume.

The simple classification here adopted was the one which seemed practically to suggest itself, nor indeed would the descriptions given have enabled us to arrange according to recent nomenclature the cases grouped together in the second section.

Care has been taken to exclude from the third table all cases except those in which the ovaries seemed the primary seat of the malignant growth.

A short analysis will be found at the end of each section of the report, but to avoid repetition, the general summary has been inserted only in the body of the work. See chap. lxxv.

TABLE I.

No.	Name.	Age	Mar. or Single	Duration of Disease.	Previous History.	State on Admission and Progress.	Treatment.
1	C. S.	47	M.	16 years	Followed occupation until four months before death; "took cold" at menstrual period, and since then great abdominal pain	Admitted with severe pain in abdomen, loss of appetite, thirst, hot and dry skin	
2	J. G.	53				Tumour of abdomen, and great oedema of left lower limb	Paracentesis per vaginam
3	E. W.	37	S.	8 mths.	Menstruated regularly until 10 months before death, and noticed abdominal enlargement two months later	Six quarts of purulent fluid escaped by tapping; after this she suffered from sickness and diarrhoea, which continued until death, a month afterwards	Paracentesis
4	M. H.	40					
5	E. K.	38					
6	M. L.	62	M.	2 years	Sixteen children. Fluid re-accumulated in six weeks after first tapping	Since second operation there has been a draining of watery fluid at various times	Paracentesis
7	F. H.	21	M.	5 mths.	Said she was well at time of marriage, five months before death	Appeared to suffer from chronic peritonitis. Became excessively wasted with distended and painful abdomen	

MONOCYSTIC (*so called*) OVARIAN TUMOURS.

Immediate Cause of Death.	Which Ovary affected.	Adhesions.	Post Mortem Appearances.	Complications.
	Right	Visceral	The cyst had communicated with a portion of Floum, and was full of fluid fæces	Vomica in right lung and empyema on left side.
Exhaustion	Right	Omental only	Cyst was simple, and contained four or five pints of puriform fluid and lymph	Left iliac vein obliterated,
Peritonitis		Visceral and parietal	Cyst was simple, no other appearing in connexion with it inside or out. Intestines adhered to each other. Uterus reached to umbilicus.	Tubercular disease of lung.
Exhaustion and Peritonitis	Left	Visceral and parietal	Cyst walls covered with flakes of lymph, and an opening existed at lower and posterior part, which would admit the points of two fingers; this communicated with rectum, five or six inches above anus. Cyst filled abdomen.	
Exhaustion and Peritonitis	Right	Parietal	Peritoeal cavity contained turbid fæculent fluid. Cyst as large as foetus at full term, and communicated with transverse colon by an aperture two inches in circumference. Aperture in cyst at lower part lead to ulcerated cavity between rectum and vagina having no other exit. Uterus six inches long.	
Exhaustion and Peritonitis	Left		Cyst occupied more than half abdomen; its parietes were dense, and its contents at upper part serous, but at lower part purulent. Pelvic organs but little interfered with	
Exhaustion and Peritonitis	Left	Visceral and parietal	Large simple ovarian cyst, its inner surface covered with layers of lymph, and its cavity containing purulent fluid. Intestines matted together. Post-peritoeal collulitis pressing on inferior cava. Cyst extended to umbilicus	Cretaceous deposit in one lung.

Table I.

No.	Name.	Age	Mar. or Single	Duration of Disease.	Previous History.	State on Admission and Progress.	Treatment.
8	A. S.	36				Had Bright's disease ; also abdominal tu- mour, which was resonant on percus- sion, and on striking it a loud splash was heard	

ANALYSIS OF MONOCYSTIC CASES.

Of these Eight Cases—

1	proved fatal	...	...	...	...	...	between 20 and 30
4	,,	...	...	...	...	...	,, 30 and 40
1	,,	...	...	...	...	...	,, 40 and 50
1	,,	...	...	...	...	...	,, 50 and 60
1	,,	...	...	...	...	...	,, 60 and 70

Continued.

Immediate Cause of Death.	Which Ovary affected.	Adhesions.	Post Mortem Appearances.	Complications.
Exhaustion		Visceral	Cyst size of human head. The gas which escaped when it was opened was fæculent. The cyst was about a quarter full of fluid, the remainder being air. There was a direct passage to upper part of rectum, and an ulcerated spot was found through which a probe passed to a small circumscribed space, outside and beneath cœcum.	

SEAT OF DISEASE—

The Right Ovary was the seat of disease in three cases, and the Left in three; while, in the remaining two, the ovary affected is not stated.

TREATMENT AND CAUSE OF DEATH—

In THREE cases Tapping was performed; one of these sank from Peritonitis, and two from Suppuration of the Cyst.

In FIVE cases the disease was allowed to run its course, and in four of them the Cyst ulcerated into some portion of the Bowel,—into Ileum in one; Colon one; Rectum two; and in one case death followed from Peritonitis.

TABLE II.

N o.	Namo.	Ago	Mar. or Singlo	Duration of Disease.	Previous History.	State on Admission and Progress.	Treatment.
9	C. T.	61					
10	S. Y.	24		4 mths.	Seized sudden- ly with acute pain in abdo- men, sick- ness, and rigors.	Abdomen tender on pressure. Abscess in right groin of fecal character. Diarrhoea	
11	A. T.	67					
12	M. L.	33	M.	16 mths.	Noticed en- largement of abdomen soon after last confinement. Great pain in abdomen for four months. G e n e r a l health much affected.	After admission an ab- scess formed and dis- charged pus and fluid feces. This con- tinued until death	
13	M. J.	22	M. No chil- dren	12 mths.	Abdomen in- creased in size for first nine months, when she had severe diar- rhoea, and the tumour decreased	Intestinal discharges copious and muddy, but not obviously containing pus. Tu- mour varied in size, according to amount of diarrhoea	Anodynes, laxatives, &c.
14	C. E.	57				Tumour occupied great- er part of abdomen	Paracentesis

POLYCYSTIC, &c. OVARIAN TUMOURS.

Cause of Death.	Ovary affected.	Adhesions.	Post Mortem Appearances.	Complications.
Exhaustion (Suppurating cysts)	Left	Visceral and parietal	Large compound cyst filled abdomen. Some foetid gas escaped when opened, and an aperture of communication to ascending colon existed, which would admit an ordinary lead pencil. The cysts were suppurating	
Ditto	Right		Large faecal abscess among pelvic viscera, passing along iliacns and psoas muscles, and down thigh, where it had discharged itself. Right ovary destroyed by suppuration, and from this part the suppurating cavities passed in various directions. Two openings into rectum, and one into bladder. Faecal matter in bladder as in abscess	
Ditto	Left	Visceral and parietal	Tumour reached to umbilicus. One cyst, as large as the remaining ones together, was suppurating, and had discharged itself externally during life	
Ditto, and Pleuro-Pneumonia	Left	Ditto	Tumour as large as child's head at full term, extended from left to right side. There was a faecal abscess on right side, bounded by abdominal walls in front and by caecum and tumour behind, the latter was partially sloughing and involved in the suppuration, and the opening from intestine was found to be in ascending colon near caecum.	
Exhaustion from mucous irritation	Left	Visceral	Tumour as large as head of child two years old, and contained foetid air and about a pint of thick fluid. An opening communicated with caecum, which, as well as ascending colon, contained some of the morbid fluid. No recent peritonitis	
Exhaustion (suppurating cysts)		Visceral and parietal	Cyst resonant and air escaped when it was opened. Cysts suppurating. Probably a connection existed with large intestine. Uterus appeared as long fibrous band on anterior wall, its lengthouing being most remarkable, and formed chiefly by the body of the organ	Pleuro - Pneumonia

Table II.

No.	Name	Age	Mar. or Single	Duration of Disease.	Previous History.	State on Admission and Progress.	Treatment.
15	A. M.	70	M. had children	2 years.	Abdomen increased in size gradually until two months ago, then more rapidly	Physical signs those of non-encysted dropsy, but the fluid drawn off was ovarian. Sank three days after operation	Tapped (14 pints and a half)
16	J. R.	42	M.	More than a year.	Came to Hospital about a year before death, with great oedema of legs. Pelvic tumour was detected, which, from its median position, was supposed to be uterine. Left relieved	Returned a little before death, emaciated; lower part of abdomen hard and tumid, with little, if any fluctuation. Great oedema of lower extremities	
17	S. G.	44			Brought from neighbouring poor house, post mortem, to be examined.	Hard, moveable tumour, felt a little below umbilicus	
18	L. C.	33					
19	M. S.	26	M.	3 years.	Had not menstruated for 4 years, viz., since last confinement. Had doubled in size during last six months	Abdomen very large. She complained only of the lumbar pain and the weight of tumour	Paracentesis

Continued.

Cause of Death.	Ovary affected.	Adhosiions.	Post Mortem Appearances.	Complications.
Acute Peritonitis	Left	None	Two or three pints of brown gelatinous fluid existed in the abdomen. Tumour, size of largest orange, occupied pelvis, and consisted of a cyst upon whose upper surface was a round opening into the cavity of peritoneum, through which protruded a bunch of small pedunculated growths, and from which exuded a gelatinous fluid	
Ditto		To abdominal & pelvic viscera	The large cyst, which occupied the whole of the lower part of abdomen, and which had several cysts on its inner surface, had given way at one point, and allowed the escape of contents into peritoneum. The bladder was perforated at anterior part, and communicated with diseased symphysis pubis. Iliac veins and cava pressed on by some pale and large absorbant glands	
Ditto from rupture of cyst	Left		Large quantity of sanguinolent fluid in peritoneum. A portion of cyst had burst, and its contents extravasated into peritoneal cavity had set up the fatal peritonitis. Most of the secondary cysts were filled with thin bloody fluid	
Acute Peritonitis	Left	Several	Peritoneum contained a quantity of morbid serum and lymph. The largest cyst contained half-a-gallon of greenish fluid. Another smaller one was situated nearer peduncle, and a third had ruptured into peritoneum. The opening was about sixth of an inch in circumference	
Ditto		Visceral and parietal	Tumour very large. Old and recent peritonitis. Three or four pints of mucus of sac were found in peritoneal cavity, mixed with some puriform and partially fibrinous matter. Uterus enlarged and stretched over part to which it was adherent	

Table II.

No.	Name.	Age	Mar. or Single	Duration of Disease.	Previous History.	State on Admission and Progress.	Treatment.
20	E. S.	37		8 mths.	Noticed abdomen to swell eight months before death. Pain in back previously. Catamenia regular, until eight months ago	Large tumour occupying hypochondriac, lumbar, and iliac regions on right side—fluctuating and tender to the touch. Peritonitis two days after operation; died in about a week	Paracentesis. (Six quarts of a dark brown fluid)
21	C. D.	27	M. 3 children, youngst. five years old	4 years	Increased in 8 mths to size of pregnancy at full term. Stationary until two mths before admission, since when the increase had been almost daily perceptible. Severe abdominal pain 6 weeks before admission	Brought into hospital in a state approaching collapse; she, however, rallied. Collapse returned three days after operation, and she died in about twenty hours	Paracentesis. Four ozs. only escaped at the time, and about two gallons subsequently
22	S. W.	22			.	Abdomen greatly distended. Left lower extremity cedematous. But little emaciation of body. Died soon after last operation	Paracentesis. Three times
23	M. E.	30				Died short time after operation	Paracentesis
24	M. A.	32					Ditto
25	A. H.	15					Ditto

Continued.

Cause of Death.	Which Ovary affected.	Adhesions.	Post Mortem Appearances.	Complications.
Peritonitis and pleurisy	Left	Parietal	The tumour was equal in size to a two-gallon measure. The contents of the large cyst were thin and fluid; those of the small ones, thick and white	Pleurisy and hydrothorax.
Peritonitis			Universal peritonitis, some recent and other old	
Exhaustion	Left	Only to Omentum	Very little evidence of inflammation around orifices made by trochar. There were no adhesions to abdominal walls at that point. Fallopian tube stretched across tumour. Walls of secondary cysts were extremely thin. Glands along iliac vessels enlarged, and in a state approaching to suppuration	
Exhaustion (suppurating cyst)	Left	To anterior parietes. Adhesions were recent except near umbilicus.	Contents of large cyst were puriform, those of the small ones grumous.	Nutmeg liver, coarse kidney
Acute Peritonitis	Left	Omental	Suppurative inflammation in cyst, which had been punctured. Abdomen greatly distended by the large multilocular tumour. Peduncle of tumour wide and expanded. Fallopian tube stretched to length of twelve inches	
Peritonitis	Right	Visceral and parietal	Parent cyst walls in acute state of inflammation	

Table II.

No.	Name	Age	Mar. or Single	Duration of Disease.	Previous History.	State on Admission and Progress.	Treatment.
26	F. D.	32	S.	Six years	Has gradually increased in size. Catamenia ceased seven months before death.	Great dyspnœa and œdema of legs. After last operation, fluid continued to discharge which became purulent, and a fortnight later about four gallons of purulent fluid suddenly escaped	Paracentesis four or five times within last 7 months
27	I. H.	38	M. had children	Four years	Enlargement at first obscured by pregnancy. Delivered of dead child.	Collapse and delirium, which lasted about 24 hours succeeded the injection; but she then rallied. Gradually sank eight days after operation. Iodine was found in saliva and urine	Paracentesis six times, and injection with iodine once
28	M. J.						
29	M. F.	16	S.		Enlargement of abdomen for several weeks	Fluctuation. No tumour felt. Universally dull, but greatly distended. Thought to be simple peritoneal effusion, or perhaps tubercular. Hectic and abdominal tenderness after operation	Paracentesis
30	F. L.	24				Pyrexia after each operation. After the last, thin purulent fluid continued to escape. Hectic and sickness	Paracentesis 11 times

Continued.

Cause of Death.	Which Ovary affected.	Adhesions.	Post Mortem Appearances.	Complications.
Exhaustion (suppurating cyst)	Right	Visceral and parietal	The large cyst, which had been tapped, would have held gallons of fluid; it now contained only purulent fluid, and its walls were coated with layers of lymph. Tumour filled the whole abdomen	Spots in kidney, short of suppuration
Exhaustion (inflamed cyst)	Right	Ditto	Tumour extended to Epigastrium. The largest cyst would have held gallons of fluid. The contents were dark brown fluid of a foetid character, fibrinous coagula and creamlike matter. Inner surface covered with adherent flakes of lymph. The fluid still contained a trace of iodine.	
Ditto	Left	Ditto	Greater part formed by a single cavity with coffee coloured contents, its lining membrane being injected or ecchymosed. Several circular patches of ulceration existed, tending to perforation. In another cyst there were several points of white slough, surrounded by a thin injected edge, in different stages of perforation.	
Exhaustion (suppurating cyst)	Right	Simply to anterior abdominal parietes	All the physical signs of peritoneal effusion when excessive. On opening the abdomen it was still thought to be simply peritoneal, but closer examination revealed ovarian cysts closely applied to abdominal walls, reaching from side to side. One large cyst, with a few secondary ones, filled with several pints of thick pus, and coated with flakes of lymph.	
Ditto	Left	Simply to anterior parietes for about three inches around umbilicus	Tumour filled whole abdomen, reaching from pelvis below to stomach and liver above. Walls of principal cyst covered with lymph, and containing purulent fluid.	

Table II.

No.	Name	Age	Mar. or Single	Duration of Disease.	Previous History.	State on Admission and Progress.	Treatment.
31	I. C.	19		Two years	Abdomen in- creased in size soon after sudden exertion, and a large tu- mour existed in 6 months. Remained in hospital then for 3 months	Coased to menstruate, after admission, six months before death. Few hours after last operation became col- lapsed, as if from loss of blood, and died in twenty hours	Paracentesis six times
32	H. C.	20	S.		Out of health for some time. Attacks of pain before tumour show- ed itself	Tumour extended to umbilicus. Did not appear to belong to one side more than the other. Obscure fluctuation	Paracentesis
33	E. W.	28		Few years	Required to be tapped sever- al times, the fluid some- times puri- form, at other times ropy and viscid	Imperfectly emptied by tapping. At first, health but little af- fected; but later, suffered pain and ten- derness of abdomen after each operation	Paracentesis thirteen times
34	I. R.	40	M	Two years	Produced but little de- rangement of health. Ropy and mucif- orm fluid escaped after tapping, not proportional to size of tu- mour	Great distension of ab- domen. Fluctuation, but obscure. Varicose veins of legs. Sank rather rapidly after last operation	Paracentesis five times
35	A. E.				Large quantity of fluid re- moved by tapping		Paracentesis twice

Continued.

Cause of Death.	Which Ovary affected.	Adhesions.	Post Mortem Appearances.	Complications.
Hæmorrhage. Acute peritonitis	Left	Visceral and parietal	Old and recent adhesions between folds of intestines. Pint of coagulated blood in peritoneal cavity. The ovarian tumour, which would have filled a pail, occupied the whole abdomen	Pleuritic effusion (two quarts)
Acute peritonitis	Left		Behind tumour was a sac, bounded by old adhesions and with purulent contents. The tumour consisted chiefly of one large cyst, containing clear serum. Left fallopian tube passed over cyst, much enlarged and thickened. This was felt as a firm cord during life. Cavity of cyst contained some grumous substance, similar to that in sac above mentioned, with which it was supposed to communicate. It would appear as if some of the cysts had burst, and produced peritonitis and the formation of the purulent sac	Chalky concretions at apex of one lung
Acute peritonitis	Left	Parietal	Surface of peritoneum pink and vascular, and its cavity contained two gallons of turbid fluid. The largest cyst contained a pailful of fluid, and the fallopian tube, which was thickened and elongated, was closely bound down to it	
Ditto	Left	Parietal	Sev'ral ounces of sanguinolent fluid (apparently mixed with some mucus from cysts, existed in abdominal cavity. Tumour extended above umbilicus its peritoneal covering and the parietal peritoneum were red and vascular	
Ditto	Right	Visceral (slight)	The walls of the large compound cyst were in a suppurating condition.	

Table II.

No.	Name	Age	Mar. or Single	Duration of Disease.	Previous History.	State on Admission and Progress.	Treatment.
36	S. D.	25	M.	More than six mths.	Delivered of a living child six months before death, after which she never re- turned to na- tural size and had since in- creased	Re-admitted with symp- toms of general peritonitis, and with the wound where she had been tapped in a sloughing condition, having had erysipelas	Paracentesis once
37	M. M.	33			No history, ex- cept admitted thirteen days before death	Umbilicus protruded so as to form a tumour about size of walnut, which was filled with cellular membrane, infiltrated with pus— it appeared to have a communication with abdominal cavity	Ditto
38	R. C.	36	S.		Felt pain on right side of abdomen on- ly 7 weeks before. Œdema of one leg, and subsequently of both	Anæmic. Abdomen hot and tender. Irregular shaped mass occupy- ing inferior part of abdomen, on left side The general aspect of patient, together with vascular appearance of abdominal walls and rapid progress of dis- ease, produced an im- pression that it was malignant	
39	E. C.	31					Paracentesis (several times)
40	S. S.	57		Seve- ral years			Paracentesis
41	S. E.						Paracentesis three weeks before death

Continued.

Cause of Death.	Which Ovary affected.	Adhesions.	Post Mortem Appearances.	Complications.
Pyæmia	Left	Visceral and parietal	The largest cyst contained about a quart of purulent fluid, and was only half full. One solid mass seemed to have sloughed, being loose and resembling pus. Fallopian tube stretched over tumour. Among the intestines were many purulent collections, with massive but feeble fibrinous boundaries, all recent	Pyæmic abscesses in lungs
Peritonitis		Parietal	General peritonitis. Purulent collections in lumbar regions. Tumour was the size of a small wash hand basin. Secretion of large and small cysts exceedingly viscid	
Peritonitis (Suppurating Cysts)	Right	Visceral and parietal	Ovarian cyst filled abdomen. Lymph in abdomen was recent. The cyst contained several pints of pus, and solid growths at lower part	
	Left	Ditto	There was considerable amount of ascitic fluid. Contents of cysts very viscid.	
Exhaustion (suppurating cysts)	Left	To omentum above, and abdominal walls in front	Tumour reached up to diaphragm. The larger cyst was filled with lymph, commencing to suppurate	
Peritonitis (suppurating cyst)	Left	Visceral	Purulent lymph in abdominal cavity. Tumour filled abdomen. One of the large cysts contained inflammatory lymph and pus. Left corner of uterus dragged up, and would probably have been included in ligature had tumour been removed	

Table II.

No.	Name.	Age	Mar. or Single	Duration of Disease.	Previous History.	State on Admission and Progress.	Treatment.
42	P.	40	M.	Some mths.	Rapid re-accumulation after tapping. Fluid removed notropy, and hardly any turbidity produced by heat	Abdomen greatly distended. By steady pressure two tumours of the size of one's fist could be felt. Rather suddenly expired after last operation	Paracentesis repeatedly
43	J. R.	37	M. no children	Three years	Menstruated regularly. The tumour interfered with flow of urine, and there had been more rapid accumulation for the last three or four weeks, with pain	Abdomen generally enlarged and tender to touch. There were no nodules felt.	
44	N. H.	74			Having walked a long distance she was seized with pain in abdomen, and sickness. She had not noticed anything prior to this, but now found swelling in abdomen	Cyst evidently existed. Considered Ovarian, the only difficulty being the history. Left hospital improved, but was readmitted with all the symptoms of strangulated intestine	
45	S. C.	28	M.		Came in very ill with ovarian disease, and at same time pregnant	She aborted, but gradually sank	
46	A. A.	23	M. 2 children		Attacks of sickness for two years. Nine months before death, after one of these attacks and great pain, she perceived abdomen enlarged for first time	Rapid increase in size. Pail and half full of dark viscid fluid removed. Re-filled in three weeks. Sickness. Dyspnoea	Paracentesis

Continued.

Cause of Death.	Which Ovary affected.	Adhesions.	Post Mortem Appearances.	Complications.
	Right	Parietal	The fallopian tube of right side was stretched across the compound cystic tumour. The cyst was capable of holding about two gallons	
Peritonitis	Left	Visceral	Recent plastic lymph in abdominal cavity. Tumour reached above umbilicus. Several quarts of dark brown offensive fluid escaped when cyst was opened. Fallopian tube of left side stretched across tumour. The cyst contained air, though no opening existed between it and intestines (?)	
Ileus	Left	To omentum and anterior parietes	Abdomen filled with very large ovarian cyst. Early stage of peritonitis existed. On lifting up cyst a portion of ileum about four inches distant from cœcum was seen passing round its peduncle, and falling down in front, had become strangulated	
Acute peritonitis	Left		Flakes of recent lymph in peritoneal cavity. One cyst was discharging its contents, but whether it burst at time of opening abdomen or previously was doubtful. There was no corpus luteum in right ovary	Acute pleurisy
Exhaustion (inflamed cyst)	Right		Diaphragm pushed up to interval between second and third ribs, by a large tumour, one cyst in which contained about two quarts of fluid. Lining membrane roughened by lymph	

Table II.

No.	Name	Age	Mar. or Single	Duration of Disease.	Previous History.	State on Admission and Progress.	Treatment.
47	M. E.	36			Eight months ago in hospital with ovarian cyst, which was tapped	Tapped this time, and much hæmorrhage followed operation. Five days afterwards she died with symptoms of cholera	Para entesis
48	E. C.	24					Paracentesis once
49	E. S.	45				Admitted with laryngeal symptoms and Ovarian tumour. Then had erysipelas	
50	F. B.	23	S.	3 years	Catamenia ceased after first tapping, twenty - one months before death		Paracentesis six times
51	M. L.	37					
52	E. W.	44		3 mths	Catamenia irregular for 12 months. Noticed enlargement of abdomen for only three months, which had increased since then	Distinct fluctuation, and she measures one inch above umbilicus, $4\frac{1}{4}$ inches. Only a little purulent matter escaped at first tapping; at second operation about a pint of jelly-like substance	Paracentesis twice
53	E. F.	23					

Continued.

Cause of Death.	Which Ovary affected.	Adhesions.	Post Mortem Appearances.	Complications
	Right	Visceral and parietal	Tumour filled whole abdomen	
Peritonitis	Left	Visceral and parietal	Low form of peritonitis existed	
	Left	To pelvic viscera	Universal fluctuation; no solid tumour to be felt. Abdomen filled with two large cysts, one growing within another	
Peritonitis (suppurating cysts)	Left	Parietal	Diaphragm reached up to second rib. Inflammatory effusion of purulent matter and lymph in peritoneal cavity. The tumour which filled abdomen would have held four or five gallons; the contents were thick and purulent	
Exhaustion	Left	Parietal (firm)	Large tumour, with distinct fluctuation. On opening abdomen a large cyst was found occupying greater part of it; the large and small cysts filled with turbid serum. Three pints of serum of dark appearance existed in peritoneal cavity	Pint of serum in both pleural cavities
Ditto	Left	Parietal (firm)	Large tumour extended to about three inches above umbilicus, pushing uterus to left side. Secondary cysts of very variable dimensions	
Exhaustion (inflamed cyst)	Right	Parietal	Abdomen greatly distended, with distinct fluctuation. The largest cyst contained upwards of three gallons of serous fluid, its inner surface being coated with lymph. Intestines adhered to one another by old false membranes	

Table II.

No.	Name.	Age	Mar. or Single	Duration of Disease.	Previous History.	State on Admission and Progress.	Treatment.
54	S. G.	60			First symptoms were vomiting, especially in the morning, and "inflammation" of right leg. Afterwards noticed abdomen to enlarge	Great abdominal distension from ascites. Lower extremities anasarca and discharging serum	
55	L. S.	32					
56	H. W.	62					
57	A. B.	25		Three years			
58	I. J.	37	S.	Thirteen mths.	Emaciation 20 months before death. Noticed enlarged abdomen thirteen months	Much pain in back; sickness; sank three days after last tapping	Paracentesis, five times
59	A. K.	37	M. 7 children; youngest 8 years old		Ten months before death had severe pain in abdomen. This had continued, and was increased on exertion	Swelling apparently originated in left side, but now occupies chiefly the centre, as high as umbilicus. Oedema of left leg, and menorrhagia	

Continued.

Cause of Death.	Which Ovary affected.	Adhesions.	Post Mortem Appearances.	Complications.
Exhaustion	Right		Half a gallon of serum removed from peritoneal cavity. Old and recent plastic exudation. The ovarian tumour was about the size of a child's head, and some of the smaller cysts appeared as if on the point of bursting	
	Left (2 or 3 small cysts in right)	Visceral and parietal	Old peritoneal adhesions. Two large multilocular cysts arose from left ovary; the one to the right side being filled with viscid contents, and that to left side with transparent fluid, the latter was in an earlier state of formation	Pleuritic effusion
Exhaustion (inflamed cyst)	Right	Parietal	Principal cyst contained about a gallon and a half of fluid, mixed with coagulable lymph	Pleuritis
Peritonitis	Right		Soft fibrinous adhesions, and effused serum in abdomen; also injection of many parts. Cream-like sediment and nearly a pailful of serum in largest cyst	
Exhaustion (inflamed cysts)	Both	-	Tumour was as large as two heads, with the right tube stretched over it; large cysts full of turbid fluid, lined with a soft layer of false membrano, and puckered cysts, with some appearance of brain like substance. Left ovary situated behind, and the size of an egg, presenting the appearance of colloid	
Exhaustion	Both	Parietal	Tumour from left ovary, the size of a gallon measure, filled with a thick white secretion; and three separate cysts, equal in size to small oranges, arose from right ovary. These were pushed down by those in left ovary, so that they were below fundus of uterus, their secretion being like that on left side. Cyst pressed on common iliac vein	

Table II.

No.	Name	Age	Mar. or Single	Duration of Disease.	Previous History.	State on Admission and Progress.	Treatment.
60	M. B.	35	M. & has children	Four years	Required to be tapped every fortnight of late		Paracentesis
61	L. E.	42					
62	E. S.	18		Six mths.	Pain in abdo- men for six months, with sickness		
63	E. B.	29	M.	12 mths.	Married five years ago, and became pregnant; swelling had rapidly in- creased of late	Left lower extremity cedematous	
64	H. B.	44	M. seve- ral child- ren	12 mths.	Youngest child three years old. Abdo- men had gradually in- creased in size since first noticed	Abdomen filled with fluid, and tumours felt at lower part. Pleurisy supervened	

Continued.

Cause of Death.	Which Ovary affected.	Adhesions.	Post Mortem Appearances.	Complications
Peritonitis and exhaustion (suppurating cysts)	Right	Parietal around puncture of trochar. To omentum, and slightly to small intestines by recent lymph	Tumour filled abdomen and extended equally on each side—one solid growth on each side felt like kidney. Contents of large cyst were thin and purulent, those of the small ones solid, and consisted of alveolar masses. Fibrous matrix lined with tessellated epithelium, and containing thick gum-like substance	
Exhaustion	Both		The right was the smaller of the two, and was about half the size of a quartern loaf; the left was very large and was made up of one principal cyst, with other smaller ones, and colloid matter.	
	Both		Each ovary converted into a tumour about the size of a coconut, oval in shape, and with a smooth surface. Under microscope their structure was seen to be fibro-cellular, and much resembling the recurrent fibroid tumours of extremities; few cysts mixed with it	Similar affection of stomach
	Left	Visceral and parietal	Tumour occupied more of left than of right side, and nearly filled abdomen; the lower and greater part consisted of a solid growth intermixed with cysts, the upper part of thin-walled cysts filled with watery fluid. Structure of tumour under microscope resembled ordinary recurrent fibroid tumours. There was none of viscid substance seen in ordinary ovarian cysts	
Pleurisy	Both	None	Abdomen contained several quarts of clear limpid fluid; two large tumours, one in the hollow of each ilium; these dragged up uterus, which was opposite sacral promontory. Each tumour weighed about three pounds, and they were nearly solid throughout, though both contained some cysts at lower part. Under microscope their structure resembled ordinary recurrent fibroid tumours; their surface was smooth	Pleurisy with effusion

ANALYSIS OF CASES.

Of these 56 cases of Compound Cysts death occurred—

Under 20	...	...	...	...	in	4	(the youngest being 15)
Between 20 and 30...	..	...	...	...	in	16	
„ 30 and 40...	...	...	...	...	in	17	
„ 40 and 50...	...	...	...	...	in	8	
„ 50 and 60...	...	...	...	...	in	2	
„ 60 and 70...	...	...	...	...	in	4	
„ 70 and 80...	...	...	...	...	in	2	
Age not stated	...	...	...	...	in	3	
						56	

SEAT OF DISEASE—

The Left Ovary was diseased	...	...	...	...	in	30	cases
„ Right „	„	„	...	...	in	15	„
Both Ovaries were diseased	...	...	...	...	in	5	„
Not stated	...	...	...	...	in	6	„
						56	

Of the five cases in which both ovaries were affected, three occurred in the so-called Fibrocellular Tumours, and two in the Colloid.

It is, however, but right to mention that two or three small cysts existed in the right ovary of one case, in which the principal disease was on the left side [Case 55].

Twelve cases discharged their contents during life—

Into Peritoneal Cavity	...	...	...	...	6	3 after Tapping.
„ Colon	...	...	...	...	2	
„ Cœcum	...	...	...	...	1	
„ Colon and Externally	...	...	...	...	1	
„ Rectum, Bladder, and Externally...	...	...	...	...	1	
„ Externally	...	...	...	...	1	
					12	

In twenty cases the cyst walls are stated to have undergone inflammatory changes,—and fifteen of these had been tapped.



TABLE III.

No.	Name.	Age	Mar- or Sing	Duration of Disease	Previous History.	State on Admission, and Progress.	Treatment.
65	E. C.	24	S.	12 mths.	Health always good until a year ago. Swelling then appeared on left side, which had gradually increased. Menorrhagia for 6 months	Abdomen so distended on admission that tapping was being discussed; she, however, suddenly became worse. Left leg swollen	
66	E. H.	51					
67	J. T.	55	M.	9 mths.	Well till 12 months ago. She then had sickness &c In 3 months noticed a small lump on left side of abdomen, and 2 months later another larger and more irregular one on the right side.	Tumour on right side extending to lower part of epigastric and right hypochondriac regions. Slight fluctuation. Pain only on pressure. Only a little blood escaped from puncture made by trochar.	Paracentesis
63	M. D.	35	M.			About five months advanced in pregnancy. Premature labour induced	

MALIGNANT OVARIAN TUMOURS.

Cause of Death.	Ovary affected.	Adhesions.	Post Mortem Appearances.	Complications.
Exhaustion	Left	Visceral and parietal	Tumour round and of large size. Peduncle was found to be between three and four inches broad, and nearly an inch thick, being converted into one solid mass of cancer. Contents of some of the cysts were of an opaque white colour, others resembled linseed tea. Large masses of cancer at lower part, and soft encephaloid growths sprouting from walls of cysts. Cancerous nodules in various parts of peritoneum	Secondary cancer of pleura with effusion of lungs, liver, limber glands, &c.
Ruptured colon; acute peritonitis; suppurating cyst	Both	Ditto	Large cyst of left ovary filled two-fifths of abdominal cavity, which had dragged up the uterus, stretching it enormously. The cyst was in a state of suppuration, and cancerous growths projected into its cavity. Right ovary was the size of an apricot, and composed of soft medullary cancer. Sigmoid flexure was behind tumour enormously distended. Colon ruptured just above point where tumour pressed on and flattened sigmoid flexure	Cancerous nodules of liver. Both iliac veins pressed on by tumour; left had an ante-mortem clot in it. Great cedema of lower extremities
Exhaustion	Left	Ditto	Large compound tumour of ovary containing large cancerous growths and fluid, and also a mass composed of hair, teeth &c. The abdomen was almost filled with the growth	Cancer of mesenteric glands &c.
Acute peritonitis	Both	Ditto	Lymph covering every part up to diaphragm. Two large ovarian tumours reached above umbilicus. Between the two were coils of small intestines matted together. The tumours consisted of numerous cysts, containing large, soft, cancerous growths	Cancerous ulcer of rectum; this had ulcerated through and the pelvic cellular tissue was sloughing.

Table III.

No.	Name	Age	Mar. or Single	Duration of Disease.	Previous History.	State on Admission, and Progress.	Treatment.
69	A. H.	45	S.	10 mths.		Abdomen greatly distended. Relieved after tapping, but fluid reaccumulated and she gradually sank	Paracentesis
70	E. C.	28	S.	18 mths.	Increase in size at first gradual, but subsequently more rapid, and so great as to impede respiration	Fluctuation at sides	Paracentesis (twice)
71	P. C.	56				On left side of abdomen was a large tumour, the upper part of which was lost beneath intestines. Excess of white corpuscles in blood. Tumour supposed to be connected with spleen. Jaundice with enlarged liver	
72	E. F.	36				Large tumour in abdomen	
73	A. R.	54	M. two children.	2 years		Abdomen greatly distended. She became very prostrate after last tapping, and suffered from vomiting, and great dyspnoea	Paracentesis (3 times)

Continued.

Cause of Death.	Ovary affected.	Adhesions.	Post Mortem Appearances.	Complications.
Acute peritonitis	Both	Visceral and parietal	Recent peritonitis. Peritoneum covered with cancerous nodules. The ovarian tumours consisted of large cysts with cancerous masses internally	Cancerous tubercles on pleuræ, and effus on each side.
Acute peritonitis	Right	Visceral	Recent peritonitis. Abdomen contained a quantity of dark coloured serum. Large multilocular tumour of ovary; one cyst containing fluid, another cerebriform matter. Tumour filled nearly the whole abdomen. Diaphragm pushed up to third rib	Some soft cancerous growths sprouted from mucous surface of uterus.
Exhaustion	Both	Ditto	Abdominal viscera united by old adhesions. The large ovarian tumour consisted of cysts with growths of cancerous nature, and filled pelvis and lower part of abdomen. Spleen very small	Scirrhus nodules in liver.
Exhaustion	Both	Ditto	Abdominal viscera united by old adhesions. There was much ascitic fluid. Two large ovarian tumours filled abdomen, the left being the larger, and both made up of cysts with solid cancerous growths on their walls	Uterine walls thickened by cancerous infiltration. Secondary deposits in liver, lungs, and on pleuræ.
Peritonitis	Right	Slight to sigmoid flexure	Two quarts of turbid serum in peritoneal cavity. Recent peritonitis. Whole of hypogastric, umbilical, and lateral regions occupied by the tumour which was lobulated and nearly spherical. On its anterior surface were three punctures. It was made up of many cysts with medullary growths, one cyst with serous fluid, and one with a gummy, tenacious substance	Secondary cancerous deposit in lymphatic glands.

Table III.

No.	Name.	Age	Mar. or Single	Duration of Disease.	Previous History.	State on Admission and Progress.	Treatment
74	A. W.	43					Paracentesis
75	E. C.	42					
76	R. H.	23		2 years			Paracentesis (more than once)
77	S. M.	33	M.		Has had 4 chil- dren within the last five years	Admitted twice into hospital, suffering from constant sick- ness and constipated bowels	
78	S. P.	33					
79	M. M.	34		4 mths.			

Continued.

Cause of Death.	Ovary affected	Adhesions.	Post Mortem Appearances.	Complications.
Exhaustion	Both		Peritoneal cavity distended with serous fluid. Cancerous nodules on peritoneum. Both ovaries presented cysts, around as well as within these were masses of medullary cancer. The cyst contained glairy fluid besides	
Peritonitis	Both		Opaque fluid and shreddy lymph in abdomen, intestines matted together and peritoneum covered with cancerous nodules. Compound malignant cysts of left ovary. Simple cysts in right ovary	Pleuritic effusion.
Exhaustion	Left	Parietal	Large irregular tumour composed of numerous cysts with medullary cancer. Cancerous deposit in subperitoneal cellular tissue	Cancerous deposit in liver, in subpleural cellular tissue, and in lumbar glands.
Peritonitis	Both	Visceral	Large quantity of dark serum in peritoneal cavity, with recent lymph. Arch of colon was contracted, and the tumour pressed on rectum. Tumours composed of proliferous cysts with malignant growths	Cancerous nodules on pleuræ, with effusion into both cavities
Exhaustion	Left	Visceral and parietal	Abdomen contained a tumour equal in size to a child's head, originating in left ovary; its contents being a brownish fluid with medullary cancer	Uterine walls when cut into emitted softened brain like substance. Mesenteric glands enlarged.
Peritonitis	Both	Visceral	Abdomen greatly distended. Recent peritonitis. Tumour occupied the pelvis and left iliac fossa, covered with large cyst containing watery bloody fluid, the greater part, however, being composed of medullary cancer. Right ovary affected with similar disease, and size of large walnut	

Table III.

No.	Name.	Age	Mar. or Single	Duration of Disease.	Previous History.	State on Admission and Progress.	Treatment.
80	M. M.	Elderly				Hard well-defined tu- mour in lower part of abdomen. Supposed to be uterine. Ob- stinate constipation and latterly vomiting, even stercoraceous	

ANALYSIS OF THESE SIXTEEN CASES OF MALIGNANT
DISEASE OF THE OVARIES.

3	proved fatal	...	...	...	...	...	between 20 and 30
5	"	...	...	...	...	...	" 30 and 40
3	"	...	...	...	...	...	" 40 and 50
4	"	...	...	...	...	...	" 50 and 60
1	"	...	...	...	...	...	age not stated.
—							
16							
—							

Continued.

Cause of Death.	Ovary affected.	Adhesions.	Post Mortem Appearances.	Complications.
Peritonitis	Left	Visceral	Recent peritonitis. Tumour occupying hypogastric region, and containing simple serous cyst, the greater part of it, however, made up of a dense structure, except in the centre, where it was softer	Cerebriform deposit and ulceration on mucous surface of uterus.

SEAT OF DISEASE—

The Left Ovary was affected	...	...	...	...	in	5 cases
The Right „	„	„	„	„	in	2 „
Both Ovaries were diseased	...	...	...	...	in	9 „

16

CAUSE OF DEATH—

Acute Peritonitis in nine cases, in three after tapping. Exhaustion in seven cases.

TABLE IV.

No.	Name.	Age	Mar. or Single	Duration of Disease.	Previous History.	State on Admission and Progress.	Treatment.
81	M. H.	49	M. with children		Not very ill un- til a few hours before death		
82	S. V.	51					
83	C. N.	24					
84	E. S.	55				Lower extremities very œdematous; two pro- minences the size of apples over pubes	Paracentesis (once)

DERMOID CYSTS.

Cause of Death.	Ovary affected.	Treatment.	Post Mortem Appearances.	Complications.
Ruptured cyst and acute peritonitis	Left		Fatty matter from ruptured cyst in peritoneal cavity: large cyst from ovary on being opened emitted a large quantity of softened fat, and large masses of fat mixed with a quantity of hair. On surface of cyst was a thick cuticular covering, and from this there sprang long hairs, and near these three well-formed teeth. Microscope showed well-formed hairs in their sheaths, and numerous sebaceous follicles. Fat dissolved wholly in ether	
Ditto	Right	Visceral and parietal	Abdomen contained pints of fluid with shreds of lymph and a quantity of fatty matter similar to that in tumour. Inferior half of abdomen occupied by the tumour, which stretched from right side to left iliac fossa; behind and to the right it had given way, and the finger could easily be passed through this opening. The tumour contained a quantity of fat coagulated about a large mass of hair; each hair had its own bulb, and the whole, together with the fat, could be turned out in one solid mass of the size of the two doubled fists. Some cysts contained a limpid fluid, others of a mucoid character	
	Right		Right ovary dilated into a cyst containing a tumour three inches in diameter, made up of epidermic scales, fat, hair, teeth, and bone	Abscesses in lung, with pneumothorax
			Ovarian cyst containing about two pints of dirty greenish thick fluid, the sac irregularly but firmly divided by shallow partitions, and stretching across was a mass of fat and hair	

TABLE IV.

No.	Name	Age	Mar. or Single	Duration of Disease.	Previous History.	State on Admission and Progress.	Adhesions.
85	A. B.	23					
86	M. C.	26	S.	One year	Symptoms began with bilious vomiting and inflammatory symptoms, and after this suppression of menses	Hard tumour the size of a quartern loaf at lower part of abdomen. Had great pain	
87	M. R.	50					
88	E. W.	51					

ANALYSIS OF TABLE IV.

AGES AT WHICH PATIENT SANK.

Between 20 and 30	...	...	...	...	3
40 and 50	...	...	...	...	1
50 and 60	...	...	...	...	4
					<hr/> 8

Continued.

Cause of Death	Ovary affected.	Treatment	Post Mortem Appearances.	Complications
Ruptured cyst and acute peritonitis	Left		Perforation existed in the large cyst from which a fatty puriform fluid exuded. The cyst contained three distinct growths in separate loculi; in one was a bright yellow greasy matter, in another solid body with teeth, hair and greasy matter, and in the third, hair and greasy matter only	
	Left	Parietal and visceral	Walls of cyst thick and like cartilage, and containing yellow fatty offensive fluid with hair; also an isolated mass through which passed a bony mass about two inches long; there were also two other isolated portions of bone	
	Left		Very large multilocular cyst of left ovary, and below this and behind body of uterus was a cyst, the size of foetal head, having thin but dense parietes, lined by delicate cuticular membrane, and filled with very greasy matter, containing masses of loose coarse hairs, with granular and sebaceous matter	
	Right	Visceral	Tubercular peritonitis. The tumour was as large as a quart pot, and proved to be a cyst with walls of variable thickness, containing a large firm mass of adipocerosus matter resembling lard and butter mixed together. It contained also a considerable quantity of hair; uterus stretched over tumour, its neck much elongated	Pleuritic effusion

CAUSE OF DEATH.

Acute Peritonitis from rupture of Cyst into Peritoneal cavity	...	...	...	...	3
Exhaustion	...	...	...	...	5

SEAT OF DISEASE.

Left Ovary	...	...	...	...	4
Right "	...	...	...	...	3
Not stated	...	...	...	...	1
					<hr/> 8

